

# **THE GOLDEN AGE OF THE SWEDISH MODEL**

**The Coherence Between Capital Accumulation and  
Economic Policy in Sweden in the Early Postwar Period**

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## **The Swedish Growth Model - A Summary**

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**Introduction**

The Swedish model seems to be in trouble. Sweden was haunted in the early 1990s by deep and frequent financial and foreign exchange crisis. GDP growth was negative for three years 1991-1993, which is unique for the postwar period not only for Sweden but also for the OECD countries if Finland is excluded. Simultaneously, Sweden's public deficit (per cent of GDP) grew larger than in other OECD countries with the exception of Greece. To raise confidence for Sweden in international financial markets and adjust to the European Monetary Union, politicians have agreed to propose drastic reductions in public transfers.

While previously famous for its commitment to full employment, Sweden experienced a sharp rise in the rate of unemployment almost to the EU average level from 1990 to 1993. Open unemployment was reduced only marginally in the mid 1990s in spite of a Social Democratic government from Autumn 1994 and a recovery in GDP growth. The current rate of unemployment (in October 1996) is almost 8 per cent.

The Swedish case has fascinated social scientists and politicians abroad. Sympathetic observers have considered the Swedish model as a combination of the best elements from both socialism and capitalism, combining high economic growth with full employment and equality-orientated policies. From this vantage point, the current macroeconomic problems are either transitional or they reflect a betrayal of the principles of the original model.

Sceptics, on the other hand, have seen Sweden as the ultimate example of Eurosclerosis, leading to a crisis of the Social Democratic welfare state. In such a view, the present macroeconomic difficulties are unavoidable consequences of the priorities and arrangements embedded in the model.

A second sceptical group can be distinguished which is not necessarily hostile to "the Swedish model" as such, but rather questions its validity. The group argues, by reference to the Swedish crisis in the 1990s, that it is impossible to maintain full employment, income equality and a large public sector in a world of transnational firms, borderless capital markets, EU integration, strong international competition and deflationary economic policies in major OECD countries.

Sweden had experienced a "light" and a "grey" period before the darkness of the 1990s according to the prevailing objectives of economic policy. The light period coincides with the Golden Age in Angus Maddison *Phases of Capitalist Development* [1982], thus it starts when World War II is over and ends with the first oil crisis. Productivity growth was high then in Sweden, not only historically (as production growth) but also in an international perspective if countries which were seriously hit by the war are ignored. The rate of unemployment was low and the potential trade-off between low unemployment and inflation satisfactory solved, especially in the early 1970s. Fluctuations in GDP were milder in Sweden than in most other OECD countries (see [table 1](#)). The Swedish success is completed by the fact that wage and income differentials were smaller than in any other OECD country at the end of the Golden Age. Thus, Sweden confirmed during the Golden Age that growth can be combined with equality.

The grey period in Sweden starts at the first oil crisis and ends with the downturn in the early 1990s. In this period, production and productivity growth in Sweden became much lower than earlier. A similar decline occurred in other OECD countries. But it seems that Swedish growth was lower than in both comparable and competing countries (Erixon [1991]). There were also strong fluctuations in the Swedish GDP. Furthermore, inflation became higher in Sweden than earlier and also higher than in the EU and OECD (on average) during “the long peak” in the 1980s and the early 1990s. Inflation had unintended effects on income distribution both before and after taxes in Sweden. In addition, wage differential, *inter alia* between the sexes, began to widen in the 1980s.

But the macroeconomic outcome for Sweden after the first oil crisis was not unequivocally depressing. The country managed to keep “full employment” when the EU countries, including Denmark, entered the road to permanent mass unemployment. In addition, Sweden obtained a better balance between unemployment and inflation than most other OECD countries until the late 1980s. Finally, the fluctuations in Swedish GDP were not exceptional in the period under discussion.

This essay on Sweden will exclusively consider the light period, a period that is here synonymous with the Swedish Golden Age. Sweden is evaluated in terms of her growth performance. My emphasis is laid on the Swedish growth engine, the raw material industries and the large transnational companies in engineering. I will uncover the causes behind and macroeconomic effects of their success in the Golden Age particularly in relation to Social Democratic policies. This relation is addressed only peripherally or simply ignored by most of the literature on “the Swedish model”.

My motivation for a paper on Sweden in the Golden Age only is simple - the recent failures of “the Swedish model” are better understood in the light of its previous success. I will stress not only the achievements of the Swedish growth model but also its limits and negative effects. The Swedish success in 1950s and the 1960s was either temporary or paved the way to the following failures.

I will use a comparative approach to separate institutions and developments which are typically Swedish. Sweden is continuously compared to other OECD countries, primarily the other Nordic countries. My essay is a by-product of a work on economic policies in the Nordic countries in the 1980s and the 1990s (Mjøset *et al* [1997]).

## **Chapter 1 - Alternative Views of the Swedish Golden Age**

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<sup>1</sup> In an international perspective, the notion of a Swedish Golden Age is more accurate for a period which lasted from 1870 to World War I. In this period, growth in GDP per hour and per head in Sweden was higher than in any other country covered by Maddison’s study. The Swedish growth rates were also among the highest in the interwar period (Maddison [1982, pp. 44-45 and 96-98]). In contrast to other countries, growth was high in Sweden during both the 1920s and the 1930s.

<sup>2</sup> There are a few exceptions, see Erixon [1985] and Mjøset *et al* [1986].

Three theories of the Swedish success in the Golden Age can be distinguished in social science - a liberal-corporatist theory, a social democratic theory and an “external” theory about favourable international circumstances. The theories correspond roughly to the division of sceptics and friends of “the Swedish model” above. To some degree, however, the theories can be integrated.

The liberal-corporatist theory assumes that growth is impeded by public sector expansion, high taxes and compressed wage differentials (cf. Olson [1990, pp. 1-7]). Such phenomena will emerge through the claims from strong interest groups, particularly labour. High growth in the European welfare countries in the 1950s and the 1960s is simply explained by the fact, that the size and negative effects of the corporate state were still moderate. In the Swedish case, public sector growth did not accelerate until the 1970s. Liberal theorists do admit that growth might be stimulated by some corporatist tokens. According to Mancur Olson, encompassing organizations such as the LO, the Swedish TUC, have prevented price and trade regulations in Sweden. Liberal economists have added, that negative wage effects of strong trade unions are “internalized” in countries like Sweden by centralized bargaining (Calmfors [1992, p. 14]).

The social democrats share the liberal-corporatist view that centralized wage negotiations have promoted Swedish growth. On the other hand, social democratic researchers deny that small income differentials, high taxes and public sector growth have strong disincentive effects. They even claim that growth was stimulated in the Golden Age by “the Swedish model”. Solidaristic wage policy put ineffective firms under a cost pressure and labour market policies provided expanding firms with labour. Social democrats argue also, that a successful counter-cyclical fiscal and monetary policy in the Golden Age created stable conditions for private investments.

According to the “external” view, growth conditions were extremely advantageous for Sweden in the early postwar period. As specialized in raw materials and investment goods, Swedish industry was strongly favoured by the rebuilding of Europe. Moreover, its main competitors had not yet recovered from the war. Trade liberalizations engendered new market opportunities for Swedish companies which also had great possibilities to catch up new American technologies. Finally, internationalization of financial and product markets was not far-reaching, thus permitting an independent Swedish fiscal and monetary policy.

All theories of the Swedish Golden Age have weaknesses. The liberal-corporatist theory ignores one side of Swedish corporatism - the strategic role of large transnational companies, mainly in engineering. It hides, for instance, that the expansion of leading industries was promoted by Social Democratic policies. A major explanation of the worsen performance of Sweden in the 1970s and the 1980s is that the Swedish growth model became less effective and that political supports to leading

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<sup>3</sup> There are other possible elements of a social democratic growth theory. According to Ingvar Svennilson, wage earners’ accept technical change to a larger extent and are more mobile at full employment (Svennilson [1954, pp. 24, 36 and 49]).

industries have stunted growth<sup>4</sup>. Such a conclusion is also hidden by the social democrats who either tone down the economic problems in Sweden in the grey (and black) period or blame them on departures from “the Swedish model”. The fact that the large export companies are wage leaders in Sweden is disguised by both liberal-corporatist and social democratic theories where wage bargaining systems are put in focus.

In the “external” theory, Swedish growth is discussed in terms of good and bad luck or related to factors beyond the control of domestic actors. It can be objected that *adjustments* of companies and politicians to external events ultimately determine growth. The external theory also obscures the fact that internationalization has been a prerequisite rather than a new condition for “the Swedish model” in the postwar period. Moreover, the possibilities for Sweden to persuade independent monetary policies were limited already in the 1960s.

Hitherto, the meaning of the concept “the Swedish model” has been vague indeed. It remains to give the concept a more precise account.

## Chapter 2 - The Swedish Model

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<sup>4</sup> Mancur Olson’s assumption of minor trade and price regulations in Sweden is hard to reconcile with a conclusion by the OECD secretariat that weak competition, primarily in food products, construction and services, is an important explanation of high inflation and the regress of relative per capita income in Sweden in the 1980s (OECD [1992a, ch. IV]).

There is no established definition of the Swedish model. It thus comes as no surprise that views on its rise and decline are diverging. In principle, there are two ways of defining the Swedish model. The first one considers Sweden as a consensus model. References are often made to the postwar political unity as to stabilization policies and welfare programmes. Furthermore, advocates of a consensus approach emphasize the strong accord between capital and labour in Sweden originating in the late 1920s and the 1930s. Here, the 1938 Saltsjöbaden agreement that labour conflicts should be resolved through negotiations and not by non-neutral legislation is an important event. The employers' initiative to central wage agreements in the mid 1950s is another milestone in a history of Swedish consensus.

According to the consensus approach, the Swedish model was challenged by labour in the mid 1970s. The proposals of wage earner funds questioned the prerogative of private ownership. Furthermore, legislation on job security and participation broke with the tradition of non-interventionist labour relations. Employers' refusal from the mid 1980s to participate first in central wage negotiations and then in corporatist public bodies confirms the collapse of the Swedish consensus model.

The definition of the Swedish model in terms of consensus is marred by some weaknesses. It is difficult to distinguish genuine Swedish features since similar social accords have been developed not only in other Nordic countries but also in continental European countries such as Germany and Austria. Besides, it is difficult to unequivocally interpret changes in economic policy in Sweden during the 1980s and the 1990s as either an indication of or a break with the consensus model. New orientations of economic policy have received an unanimous support from established political parties but been rejected by trade unions.

I will prefer an alternative definition of the Swedish model where Sweden is seen as a country of socio-economic balance between labour and the leading industrial sector (cf. Korpi [1983]). According to this view, the priorities and instruments/institutions of a strong Social Democracy and (blue collar) trade union movement are consistent with the growth of raw material industries and transnational firms. In fact, the Swedish model is a coherent system where sustainable growth and profitability of the leading industrial sector is a necessary condition for obtaining the goals of the labour movement, and economic policy, in its turn, guarantees capital accumulation in this sector - see [figure 1](#).

Actors/sectors	<b>S</b> ocial Democratic and <b>B</b> lue-Collar Union Strength (Political, Ideological and Theoretical)	<b>E</b> xport-Orientated <b>R</b> aw Material Indu- stries and Large Trans- national Companies in <b>E</b> ngineering
Priorities	<b>F</b> ull Employment <b>G</b> eneral Welfare (Including Real Wage Growth) <b>E</b> quality	<b>S</b> ustainable <b>G</b> rowth and <b>P</b> rofitability
Means	<b>S</b> tate Interventionism for Full Employment <b>G</b> eneral Welfare Policies <b>W</b> ork Life Reforms <b>C</b> entral Wage Bargaining <b>R</b> edistributive Income and Wealth Taxes <b>S</b> upport to Leading Companies/Industries	

The parliamentary, organizational and ideological strength of the Swedish reformist labour movement in the postwar period has no correspondence in other democracies, not even in other Nordic countries.<sup>5</sup> The Social Democrats led all governments until 1976. The union density rate was, and still is, higher in Sweden than in other OECD countries both among wage and salary earners (Visser [1989]). Today, the LO organises almost all blue-collar workers in Sweden.

Labour strength resulted in a strong priority of full employment, redistribution and general welfare in Sweden in the Golden Age.<sup>6</sup> The LO had a strong influence on economic and welfare policies and on legislation to improve working conditions, job security and labour participation. Major working life reforms, however, were not decided until the end of the Golden Age.

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<sup>5</sup> Norway is the country which comes closest to Sweden in these respects. But the union density rate has decreased in Norway since the 1960s while it has increased (even from a high level) in Sweden. Besides, there is no correspondence in Norway to the influence of the LO economists on Swedish economic policies in the Golden Age.

<sup>6</sup> The generality of welfare policy is not a typical Swedish, or even Nordic, token. However, it is possible, if Denmark is excluded, to define a Nordic welfare model which is general and where compensations in social insurance systems are related to income (Korpi & Palme [1993, pp. 139-140]). Sweden's welfare reforms often became standards for other Nordic countries. For instance, the incremental pension fund system (the ATP system) was first introduced in Sweden, and then imitated by Norway and Finland (although the pension funds in Finland were based on collective agreements).

Some misunderstandings about the Swedish model must be pointed out. Foreign observers think that Swedish governments have used a particular set of instruments to obtain the objectives of economic policy. In reality, economic policies to satisfy these objectives have changed and some instruments are not typical Swedish. For instance, the Social Democratic government used a Keynesian strategy to secure full employment in the early Golden Age - labour market policies were not used seriously until the late 1950s. Furthermore, devaluations, thus, conventional measures other than deflationary policies to reduce deficits in the current account, were made also in Sweden, both in the Golden Age (1949) and regularly, in the grey period. Economic policy in accordance with the Swedish model could best be described generally as state interventionist where activity levels and employment are concerned.<sup>7</sup>

In contrast to stabilization and employment policies, the Swedish model implies a passive growth policy. It relies on the success of leading companies and industries and on measures to stabilize or improve their financial position and profitability. There is room for infra-structural investments in the Swedish model. But these have primarily been intended to increase aggregate demand in a Keynesian fashion, or to strengthen “development blocks” around leading companies and industries, not to spur the renewal of Swedish manufacturing.<sup>8</sup>

It is easier to separate Sweden from other Nordic countries on economic-structural grounds than on the basis of political institutions, labour relations and economic policy. Norway and Finland have quite similar raw material branches, most of them dominated by large companies, but (as Denmark) nothing like Sweden’s large, globally orientated, companies in other branches of manufacturing. Here, Sweden is more similar to Switzerland and the Netherlands.<sup>9</sup> However, the strong position of large transnational corporations in *engineering* in Sweden has no analogues in other small Western countries.

There are similarities between the Swedish model as defined in this article and Fordist accumulation models formulated within the French regulation school, Lipietz [1988] and Boyer [1988]. The Swedish model can be seen as a regulation regime where the interests of labour (full employment, redistribution and general welfare) are compatible with the interests of capital (stable profitability). My general account of the means of the Swedish model is consistent also with regulation theories about several possible modes of regulation.

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<sup>7</sup> My avoidance to be more precise about collective instruments shall not hide, that some of them are closely connected to the Swedish model. Labour market policies but also public employment growth are such instruments. Public employment expanded more in Sweden and Denmark than in any other OECD country in the 1960s and 1970s.

<sup>8</sup> The passive growth policy was formed already in the beginning of the 20<sup>th</sup> century. In contrast, the state had acted in the 19<sup>th</sup> century as an important financier of new industries in Sweden (Gårdlund [1947, p. 76]).

<sup>9</sup> See statistics for the OECD countries, including the Nordic ones, on large-firm dependency and direct foreign investments as a percentage of GNP (Carlson, [1979, pp. 10 and 66], Erixon [1982, p. 128] and Jagrén, [1992, p. 2]).

But the regulation theory of the French school is too abstract to distinguish leading industrial sectors and conditions for accumulation in a small open country. For instance, collective wage bargaining is governed by the aim to stabilize demand in french accumulation models. They neglect that large outward companies are wage leaders in a country like Sweden. There are hardly any Keynesian elements in the Swedish wage-formation model of the postwar period.

## Chapter 3 - The Swedish Growth Engine

### 3.1 Raw Material Industry - A Nordic Component of the Swedish Model

The real break-through of Swedish industrialization first occurred in the 1870s. It was based on a surplus of agricultural workers, high foreign demand for wood products, especially from Great Britain, new mass-producing techniques, improved communications, primarily through the construction of railway systems, and on abundant resources of wood, iron ore and water power. Since that time, raw material base industries, most of them energy-intensive and export-orientated, have been of outmost importance for Swedish export, industrial production and GDP. The raw materials' share of Swedish export value was above 50 per cent until 1957.

I will embrace the iron and steel industries, wood product industries (including saw mills) and pulp and paper industries when the Swedish raw material sector is defined. (Iron ore is excluded by my concentration upon semi-finished and finished goods.) The industries relative importance did change dramatically until the Golden Age. Export of wood products dominated Swedish export until World War I. It had decreased already at the turn of the century due to harder competition from Finland and Russia. Instead, export of pulp and paper grew tremendously from the 1890s, with pauses only for World War I and the depressions in the early 1920s and the 1930s<sup>10</sup>. In fact, Sweden became the world's largest exporter of pulp before World War I.

In contrast to pulp and paper industries, iron and steel producers experienced periodical demand crises and strong foreign competition already from the 1870s. They were, as saw mills, seriously hit by the depressions in the early 1920s and 1930s and by sharper international competition in the 1920s. However, the Swedish export of iron and steel products rose more (both in value and volume) than export of pulp in the 1930s primarily through German rearmaments.

Up to this point, I have not given Sweden a more advanced role than as a producer of what is conventionally classified today as demand-fluctuating, low technological products.<sup>11</sup> In this respect, Sweden is not different from other Nordic countries with the exception of Denmark.<sup>12</sup> But there is an economic-structural condition which separates Sweden from all its Nordic neighbours - the importance of large transnational companies in engineering.

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<sup>10</sup> However, the depression in the 1930s was mild for Swedish paper industries.

<sup>11</sup> However, until World War I, pulp export reduced the cyclical swings in the Swedish economy.

<sup>12</sup> Sweden was not even a Nordic technological leader in raw material industries in the early industrial period, at least not in wood-product industries, cf. Gårdlund [1955, p. 248] and Sejersted [1993, chapter 3].

## 3.2 Outward Large Companies in Engineering - An Un-Nordic Component of the Swedish Model

### 3.2.1 *The First Innovation Wave*

A cluster of innovations can be traced in Sweden from the end of the 19<sup>th</sup> century until World War I. As a result, a large number of “genius companies” was established in Sweden. Swedish economists have claimed, that there is no correspondence in industrial history to the tremendous innovative strength of Sweden at the turn of the century and to the limited number of persons involved (Dahmén [1950, p. 366]).

Atlas, later *Atlas Copco*, was established already 1873 as a producer of railway equipment, primarily carriages, for the Swedish market. However, Atlas started a production of pneumatic products (compressors and rock drills) in the early 20<sup>th</sup> century. Pneumatic equipment became the company’s main product already before the end of World War I.

The telephone company (*LM Ericsson*) was founded by Lars Magnus Ericsson in 1876. Ericsson invented a table telephone apparatus in 1884. The company developed, in collaboration with an independent company founded by Henrik Cedergrén, comprehensive telephone systems for Sweden.<sup>13</sup> The two companies merged in 1918.

The separator was an invention in the late 1870s by Gustaf de Laval which laid the foundation of a Swedish dairy machinery industry. De Laval was one of the founders of Separator, later *Alfa-Laval*, in 1883. He was also an inventor and entrepreneur in other engineering fields. The steam turbine became de Laval’s most successful invention beside the separator.

The electro-technical company *ASEA* was established in 1891 through a merger of two companies based on Swedish inventions, primarily engines for alternating current developed by Jonas Wenström. The company soon developed technologies related to long-distance transfers of electricity. In 1916, *ASEA* required *STAL*, a producer of high precision turbines. *STAL* had been founded by Birger and Fredrik Ljungström in the 1890s.<sup>14</sup>

Inventions by Gustav Dahlén (together with Henrik von Celsing), using gas for illumination purposes, led to the formation of a company 1904 later known as *AGA*. Soon, *AGA*, with Dahlén as a manager director, got a strong position on world markets, first for light-house techniques, then for gas for industrial and medical use.

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<sup>13</sup> In 1885, Stockholm had more telephone subscribers in absolute terms than any other city in the world (Schön [1990, p. 40]).

<sup>14</sup> *STAL* merged 1959 with a company based on de Laval’s steam turbine.

The invention of self-regulating ball bearings by Swedish technicians led to the formation of *SKF* (Svenska Kullagerfabriken) in 1907. In short time, the company became a world leading producer of ball bearings<sup>15</sup>.

It remains to explain why Sweden, but not, for instance, other Nordic regions, developed a superior innovative strength at the turn of the century<sup>16</sup>. The reasons are not obvious.<sup>17</sup>

Mechanisation of agriculture and of textile industry, which generated the technical base of dairy machinery and ball bearing industries in Sweden, happened simultaneously in Norway and Denmark. Furthermore, Norway and Denmark had no less developed educational systems than Sweden at the industrial revolution<sup>18</sup>. International contacts, established *inter alia* by export-orientated, raw-material industries, facilitated education of Swedish engineers in Germany, France, Great Britain and the U.S, but here, Sweden did not hold an unique Nordic position. Long travel distances have been quoted as an explanation of Sweden's development both of long-distance energy transmission systems, and later, of heavy trucks, but in this respect, Sweden is not different from Finland and Norway. Besides, the original Swedish advantage in electrical technology was devices to use and produce electricity, not to transmit electricity. Finally, other Nordic countries had the same financial base of industrialization as Sweden. Capital imports were the basis of industrialization, directly as a financial source of infra-structural investments, indirectly as domestic saving was reserved for industrial purposes (Gårdlund [1947, p. 163], Hansen [1972, pp. 176-177] and Hodne [1975, ch. 9]).

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<sup>15</sup> SKF integrated backward by the requirement of the steel company Hofors during World War I.

<sup>16</sup> Other outward companies based on Swedish inventions were established at the turn of the century such as *Bahco* 1889 (the adjustable spanner) and *Esab* 1904 (the welding code). *Bahco* became specialized in ventilation and air condition equipment and was finally required by *Fläkt* in 1987 (see footnote 26). *Esab* is owned by *ASEA* (half of the equity stock) since 1965. The company formed a joint company with *AGA* in 1987 for gas-welding operations. *Swedish Match* originally *Svenska Tändsticksaktiebolaget (STAB)*, is a company based on inventions of safety matches and machines for large-scale production of matches. The company was established through mergers in 1903 and 1917. Successively, *Swedish Match* got a diversified production including a broad range of engineering, chemical and wood products. The company was bought and reconstructed by the raw-material producer *Stora (Kopparberg)* in 1988 and by *Volvo* in 1993.

<sup>17</sup> Note that Sweden and Norway formed an union until 1905.

<sup>18</sup> Until the turn of the century, higher technical education seems to have been underdeveloped in Sweden in comparison to other countries including the Nordic ones. Moreover, the quality of the Swedish education was low at least until the 1870s. According to Torsten Gårdlund, the lower technical educational system in Sweden was underdeveloped and of low quality as well at the turn of the century. However, the Norwegian higher technical education might have been worse than the Swedish one. Schools of advanced technology were not started until 1910 in Norway but as early as in the 1820s in Sweden and Denmark. (Gårdlund [1955, pp. 224-225, 230-231 and 258-259] and [1974, pp. 43-44], Hansen [1970, p. 65] and Sejersted [1993, pp. 141-142]).

Cultural factors, such as a strong “entrepreneurial spirit” in high income-brackets, have been suggested to explain Sweden’s innovative strength at the turn of the century.<sup>19</sup> The presence of strong commercial banks from the end of the 19<sup>th</sup> century is a related explanation of “the Swedish miracle”. Domestic bank credits were the prime financial sources of Swedish manufacturing until World War I. The large banks were orientated toward industry and, by skill, chance or clairvoyance, engaged in production with promising market prospects and technological opportunities.<sup>20</sup>

The Wallenberg family and its bank (Stockholms Enskilda Bank) became important financiers of engineering firms in Sweden. Besides, the family obtained, either from the start or gradually, a position as a dominating owner of all genius companies, with the exception of AGA, and also of several raw material companies including *Syngara* (Kopparberg) and the Norwegian *Norsk Hydra*.<sup>21</sup> It is true that the new companies soon became manager-led. But the Wallenberg family was an active, technical and foreign-market orientated owner and financier, engaged in strategic decisions on investments and selection of managers. The key position of the Wallenberg family in Swedish industrialization has no correspondence in other countries.

It is difficult to distinguish the decisive factors behind “the industrial wonder” in Sweden. Comparative studies offer some clues but the explanations will vary depending on which countries Sweden is compared to. My emphasize on the industrial orientation of upper classes and the strategic role of commercial banks in Sweden follows from my Nordic framework.<sup>22</sup> In any case, more important from my

<sup>19</sup> It has been argued also, that Swedish civil servants were trained and independent enough to respond to demands from a differentiated industry, Jörberg [1961, pp. 14-15]. Another argument is that new companies in Swedish engineering were sheltered from foreign competition in their first vulnerable phase, especially on home markets, by tariffs and patents. Separator’s possession of the “Alfa patent” 1889 -1903 is often quoted, cf. Gårdlund [1947, p. 155] and [1983, pp. 142-152 and 228-234] and Jörberg [1961, p. 15].

<sup>20</sup> Gårdlund [1947, pp. 123, 128-129, 136, 152-153 and 163], Gårdlund [1955, pp. 178-211] and Glete [1987, pp. 83-91, 111-115, 248-260 and 266-270].

<sup>21</sup> The Wallenberg family controlled Atlas from the start, and also Atlas-Diesel, a company established in 1917 through a merger between Atlas and an engine company formed and controlled by the family. In contrast, the Wallenberg family had some minor shares only of ASEA in the beginning. But, in the first decade of the 20<sup>th</sup> century, the family played, as a financier, a decisive role in the reconstruction of the company, including in the appointment of a manager director. In the late 1920s, the family became the largest owner of ASEA and Separator (Alf-Laval) and raised its shares of the companies further in the 1930s and 1940s. In the early 1930s, the Wallenberg family got shares of STAB (Swedish Match) and (LM) Ericsson and was immediately engaged in reconstructions of the companies. The family became dominant owner of STAB in the late 1930s but not in Ericsson until 1960 (Glete [1994, pp. 119-120]). The family led a consortium which bought ITT’s shares of Ericsson corresponding to more than one-third of the voting-rights at annual meetings. The Wallenberg family was represented in the board of SKF already in the 1920s which facilitated the company’s contacts with foreign lenders. In the early 1930s, the Wallenberg family procured a dominant position in the company.

<sup>22</sup> In Norway, the upper classes were not strong or industry-orientated enough to establish large companies or large commercial banks. Furthermore, there were restrictions on commercial banks to issue bonds, Hodne [1975, pp. 327-329, 341-343 and 350] and Sejersted [1993, pp. 168-180]. Commercial banks’ financing of large-scale industry was more important in Denmark than in Norway but probably not compared to Sweden. Private banks did not achieve a dominant position on the

perspective is that the birth and early consolidation of the Swedish genius companies cannot be related to an accumulation model where labour is a salient actor in production and politics or where strong and qualified domestic demand is a prime driving force.

Social Democrats did not participate in Swedish governments until 1917. Furthermore, the Swedish labour market at the turn of the century was characterized by weak trade unions, perpetual conflicts and uncoordinated actions. Swedish workers in new companies had low skills and had often to be replaced or instructed by hired workers from other countries. Finally, Swedish innovations were not induced by demand, for instance by higher living standards in the country anticipating world demand at high development levels. Rising welfare in Sweden was a consequence rather than a cause of the industrial wonder. It is difficult to find a better example of a supply-side innovation model than that in Sweden at the turn of the century.

### 3.2.2 *The Second Innovation Wave*

The growth of the new specialized industries in Sweden was tremendous. Already before World War I, they accounted for half of the production value in Swedish engineering (Gårdlund [1955, p. 86]). A new innovation frontier was opened in Swedish engineering after the war.

The second innovation wave in Sweden was not based on domestic basic inventions to the same extent as the first wave. The term “genius” will be reserved for the companies in the first wave. Another difference between the waves is that new companies in the interwar period could be classified, if buses and trucks are ignored, as producers of durable consumption (or household) goods. The genius companies were predominantly producers of investment or public goods.

No other Nordic country succeeded to establish companies in mass-producing consumer-good industries, companies which not only survived but also obtained a strong position in world markets after World War II. It is true that consumer-goods' share of export has been lower in Sweden than in continental West European countries in the postwar period (Erixon [1982, p. 123]). But the standardized consumer industries were important growth engines in Sweden in the Golden Age, and their expansion was promoted by economic policies (see chapter 6).

The Swedish firms *Lux* and *Elektromekaniska AB* introduced the first household vacuum cleaners already before World War I. In 1919, the firms formed *Electrolux*, a major transnational producer of vacuum cleaners in the Golden Age. *Electrolux* began

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Danish credit market around the turn of the century. In addition, they were not as (export-) industry orientated or active in the formation of new industries as their Swedish correspondences. Besides, the dominating credit institutions in Denmark, saving banks and credit associations, were primarily engaged in the financing of farming and construction, not of industry, Hansen [1970, pp. 28-67]. Information about Finland is incomplete, but it seems that commercial banks did offer short-term credits only to industry about the turn of the century (Harmaja [1933, p. 43]).

to produce refrigerators in 1925 after a path-breaking invention by two young Swedish technicians.

The first motor vehicle firm in Sweden was established in the early 1890s. A merger in 1911 between two independent car producers led to the foundation of *Scania-Vabis*, specialized in trucks and buses in the 1920s. *Volvo* was established in 1926 as a producer of private passenger cars and, somewhat later, of trucks and buses. The company grew by take-overs in the 1930s and 1940s to enlarge its motor vehicle assortment and to integrate backward *inter alia* to motor industries.<sup>23</sup>

The other Swedish automobile company (beside Volvo) in the postwar period, *Saab*, was founded in 1937. Saab was first engaged in production of aeroplanes only - the company's car production did not get into its stride until after World War II.

The explanations of the first innovation wave are probably valid also where product renewals in Sweden in the early interwar period are concerned. Once again, industrial capitalists played an active role as financiers and reconstructors. An outward entrepreneur, Axel Wenner-Gren, initiated the development and sale of household vacuum cleaners and also the foundation of Electrolux where he became major owner and manager director. Saab was formed by Electrolux and by another company (Bofors) controlled by Wenner-Gren. The Wallenberg family did early take the control over Saab and, successively, over other companies in the second innovation wave. Only one of the large second-wave companies remained outside the Wallenberg sphere in the Golden Age - Volvo.<sup>24</sup>

It seems also that Swedish engineering experienced a virtuous circle in the interwar period. Technological knowledges and profits emanating from the first wave of product innovations led both to secondary innovations and to new industries.<sup>25</sup> For instance, the original electrical development block was extended, either by new firms or by established firms as ASEA and AGA, to the production of trains, trams and household products such as stoves, vacuum cleaners and radio sets.<sup>26</sup>

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<sup>23</sup> Volvo's requirement of the engine company Pentaverken (1935), today *Volvo Skördeverken* and *Volvo Penta*, and the machine company *Köpings Mekaniska Verkstad* (1942) were both examples of Volvo's ambition to broaden its motor vehicle programme and to integrate backward. Volvo did also require *Svensk Flygmotor* in 1941, a producer of aeroplane engines founded in 1930.

<sup>24</sup> The Wallenberg family gained control over Scania-Vabis during World War I. The company got into liquidation in 1921. The Wallenberg family was not engaged in product developments and the change of product composition in Scania-Vabis in the 1920s when, for instance, the company gave up its car production. (Scania-Vabis' production of buses and heavy trucks became profitable already in the late 1920s.) However, the family took an active part in the standardization (and rationalization) of the company from the late 1930s (Giertz [1991, pp. 123-170]). The Wallenberg family became major owner of Electrolux in the latter part of the 1950s and the early 1960s through its possession of Alfa-Laval and ASEA.

<sup>25</sup> Important secondary product innovations (although primarily by foreign firms) did also occur in raw material industries in the interwar period, see Dahmén [1950, pp. 124-125, 137-148 and 157-161].

<sup>26</sup> There are significant examples of new Swedish companies within the electrical development block in the interwar period. *Electro-Helios*, a producer of electrical household products, was established in

The virtuous circles in Swedish engineering were not only technical and financial but also personal. The major share of entrepreneurs in engineering in the interwar period was recruited from skilled labour (Dahmén [1950, pp. 227-228 and 386-388]). The birth of the companies in the second innovation wave which later became growth engines in Sweden can be related to established companies and owners in engineering.<sup>27</sup>

There were clear evidences of industrial “maturity” in Sweden in the 1920s and definitely in the 1930s. Some companies (especially from the first innovation wave) and owners (the Wallenberg family) then procured dominant positions in Swedish manufacturing, positions which they still hold today. From the 1930s, the success of Swedish industry largely depended on the ability of managers and main owners of established companies to adjust to new market opportunities and threats. For instance, the formation and development of new industries in Swedish manufacturing mainly became an affair of some large companies and capitalists in engineering. Thus, it had been legitimate to use a static notion such as “the Swedish growth engine” already in the 1930s.

### 3.2.3 *The Early Foreign Orientation of Swedish Companies*

“Outwardness”, or more precisely, “early outwardness”, will be seen as a precondition for the success of the large Swedish companies in engineering in the Golden Age. Thus, foreign orientation is considered as a precondition for the Swedish model.

The companies in the first innovation wave pursued already in their early phases of development a strategy of conquering foreign markets. They soon worked to overcome the limitations of the Swedish markets by foreign sales and also to use economies to scale to meet foreign competition. Already in the 1890s, Swedish engineering consisted of two groups of firms, one of large export orientated corporations, another of small and medium sized, home-market orientated and non-specialized firms (Dahmén [1950, pp. 225-229] and Jörberg [1961, pp. 77-79]).

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1919. *Fläkt* (earlier Svenska Fläktfabriken) was formed in 1920, an early outward company which became specialized in devices for heating, freezing, ventilation and air conditioning. Today the company is world leading in smoke-gas purification, energy regaining and waste treatment. *Luxor*, established in 1918, became a producer of radio sets, gramophones and loud-speakers. The company became one of the few large ones in Swedish computer industry in the 1970s (producing computers mainly for industrial purposes) but was finally required by the Finnish company Nokia in 1984.

<sup>27</sup> The birth of Volvo could both personally, financially and technically be traced to SKF. In fact, Volvo was a part of SKF until 1935. The vacuum-cleaner company Lux was a subsidiary to AGA. The founder of Electrolux, Axel Wenner-Gren, was employed by Separator (Alfa-Laval) before he initiated the Swedish vacuum cleaner industry. As already mentioned, Saab was established by Electrolux and by its main owner, Wenner-Gren. Finally, Saabs early expansion was partly financed by Wallenberg’s company *Aktiebolaget Svenska Järnverkstäderna*. The formation of Scania-Vabis cannot directly be traced to established companies and owners. However, SKF played an important technological role in Scania before the merger with Vabis.

ASEA, however, has traditionally been more home-market orientated than other companies in the first innovation wave.

Thus, domestic-demand restraints explain why Swedish genius companies became outward so early. But companies in the *second* innovation wave did not meet early domestic market-restraints and they were often foreign-orientated as well.<sup>28</sup> “Early outwardness” of Swedish companies was reinforced by political factors. A sharp increase in the export share of total sales in the 1920s, especially for genius companies, is largely explained by enlarged international trade and restrictive Swedish monetary policies. (Analogously, the decline in export shares in the 1930s is largely explained by protectionism and expansive monetary policies.) In the case of (LM) Ericsson, foreign orientation was hasten by governmental regulations not allowing the company to sell on domestic markets (Sölvelkt *al* [1991, p. 117]).

Early export orientation of engineering companies is also explained by behaviour factors such as the existence of extrovert Swedish managers and major owners. The importance of “outwardness”, irrespective of domestic demand-restraints and political conditions, is best shown by a company in the second innovation wave, Electrolux. The company’s early foreign orientation is striking in comparison to both foreign and Swedish competitors. Another, partly related, factor behind the early foreign orientation of Swedish companies, is the existence of international net-works for technicians, capital owners and firm executives. The net-works had been founded by the raw-material industries but also by companies in the first innovation wave.

The emphasize on informal net-works when the outward strategy of Swedish companies in engineering is to be explained illustrates the complexity of causal analysis in social science. A “voluntary” phenomenon, personal contacts across national borders, is explained by a structural condition, the existence of outward raw -material companies in Swedish industry.

There is another side of “outwardness” than export orientation - foreign production. Swedish engineering companies in the first innovation wave did early establish subsidiaries abroad. The main explanation is “structural”. Foreign demand for products

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<sup>28</sup> Foreign sale departments for vacuum cleaners were established by Electrolux from 1919. Electrolux’ first production plant abroad for vacuum cleaners was built in 1925 (in Berlin) and for refrigerators in 1927 (Luton), Laxén-Payro & Odhnoff [1985, p. 7]. Volvo was also export orientated from the start. The company established a department for foreign sales of cars and trucks as early as in 1928 (in Helsinki, Finland). In the late 1930s, export accounted for 20 percent of Volvo’s total sale (Plate [1985, pp. 18-24]). However, Volvo did not start a foreign production until 1958 (in Finland). The case of Scania-Vabis’ is both a confirmation and a rejection of a theory of “early foreign orientation”. The company made export businesses from the start and established assembly plants in Denmark, Norway and Russia as early as in 1913-1914 (Giertz [1991, pp.98-99]). An interruption in Scania-Vabis’ export occurred from the late 1910 to the end of the 1930s . In this period, the company had public authorities in Sweden as its only customers. The export recovery of Scania-Vabis at the end of the 1930s was rather slow. Export accounted only for 13 percent of total sales immediately after World War II. It was not raised considerably until the mid 1950s (Giertz [1991, p. 237]) . Scania-Vabis first plant abroad after the break in foreign orientation was established as late as 1957, in Sao Paulo, Brazil. As Scania-Vabis, Saab did not increase its export seriously until the mid 1950s. The company’s foreign production of private passenger cars began in the early 1970s, in Nystad, Finland.

from ASEA, LM Ericsson, Alfa-Laval, SKF and AGA must, by technical and marketing reasons, or by conveyance, be met by production abroad (Carlson [1979, pp. 43-47]). The conclusion that foreign markets must by necessity be supplied by subsidiaries abroad is valid also for refrigerators, thus for some products in the second innovation wave,. However, a strong Swedish *krona* (SEK) might have contributed to a sharp rise in Swedish companies' production abroad in the 1920s.

Early foreign sales was *not always* synonymous to early foreign production for the companies in the first innovation wave. Atlas Copco did not establish a foreign unit for pneumatic products until the late 1930s (in Great Britain).

Swedish companies in the first and second innovation wave reject traditional trade theories about engineering saying that small countries will specialize in market niches and small scale production. They also contradict the product-cycle theory saying that export, foreign production and standardization are typical of later development phases. Furthermore, they do not confirm John H. Dunning's theory that foreign direct investments in the early stage of a country's development prevent upgrading of domestic technological capabilities and reduce the competitive advantage of both the investing firms and the country itself (Dunning [1993, p. 76]<sup>29</sup>) Finally, the early "outwardness" of Swedish genius companies seems as weak evidence of a theory stating that qualified home market demand is a spring-board to international competitiveness (cf. Porter ([1990, pp. 86-99]).

However, the objection to the last theory must be modulated. Qualified demand from raw material and related industries (such as mining) and from political authorities contributed to the foreign success of Swedish engineering. Thus, other domestic agents than engineering companies must be accounted for when the Swedish innovation model is defined (see next chapter).

It remains to argue for that raw material industries and large engineering companies held strategic positions in the Swedish economy in the Golden Age. My emphasize is laid on the Swedish innovation system. As my attempt is to distinguish unique features of Sweden, I have no intention to formulate a general innovation theory, not even for small open economies in general.

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<sup>29</sup> It seems, however, that Dunning leans to the conclusion that countries like Sweden are not hit by this criticism of an early outward strategy (Dunning [1993, pp. 116-117]).

## Chapter 4 - In What Way Are the Leading Industries Leading?

The raw material industries and large engineering companies were growth engines in Sweden in the Golden Age by the following reasons:

- They accounted for a large share of production and employment in manufacturing.
- Their export and investment had a strong influence on production and employment of other Swedish firms.
- They were wage leaders.
- They were the most important producers and transmitters of new knowledge.

### 4.1 Shares of Production and Employment in Swedish Manufacturing

The raw material sector accounted for more than 20 per cent of total value added in Swedish manufacturing from the early 1950s to the mid 1970s - ~~table 6~~. The sector's share of total employment in manufacturing was generally smaller because of high capital intensity (table 6). Both shares were remarkably stable in the Golden Age.

The large companies in engineering accounted for a large and growing portion of employment in Swedish manufacturing in the Golden Age. The list of Sweden's fifteen largest companies, where employment in Sweden is concerned, was dominated by engineering and raw material industries (with ASEA as the largest) in 1945. At the end of the Golden Age, the list was dominated by engineering companies only. The growth of Saab, Volvo and Electrolux in the Golden Age is striking. They all reached a position as one of the five largest companies in Swedish manufacturing from a position outside the list of Sweden's fifteen largest companies at the end of the war.<sup>30</sup>

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<sup>30</sup> Unfortunately, there are only postwar figures of the 15 largest companies in Swedish manufacturing where employment in Sweden is concerned for 1945, 1983 and 1990, thus not for the late Golden Age (Jagrén ([1992, p. 9-11]). However, Volvo and Electrolux reached the top five (and Saab(-Scania) the top eight) in 1973 if total employment is considered that is employment in Sweden and in subsidiaries abroad (*The 1000 Largest Companies in Sweden* 1974, p. 109]).

Electrolux would have entered the list of the fifteen largest companies only a few years after 1945 or if employment abroad had been considered. The company was one of the five largest Swedish companies

Saab, Volvo and Electrolux showed high internal growth in the Golden Age but they did also expand by mergers (mainly Saab) and take-overs. The aim of requiring other firms was to either become national champions (mainly Electrolux), get broader product assortments (mainly Electrolux and Volvo) or integrate backward (mainly Volvo).<sup>31</sup>

The large engineering companies' larger shares of Swedish employment in the Golden Age are shown by table 8. Alfa-Laval, ASEA, Atlas Copco, Electrolux, Ericsson, Saab(-Scania), SKF and Volvo accounted together for 13 per cent of total employment in Swedish manufacturing 1966. The share increased to 15 per cent in 1970 and to more than 17 per cent in 1973.<sup>32</sup>

#### 4.2 Net-Works and Multipliers

An extensive net-work of supporting industries has emerged around the raw material industries and large engineering companies in Sweden. Swedish manufacturing was characterized in the Golden Age by a significant number of supplying firms strongly dependent on orders from the large companies. This dual economy can be distinguished, as already noted, in the 19<sup>th</sup> century.<sup>33</sup>

In addition, mutual orders linked the large raw material and engineering companies to each other in the Golden Age. Investments by capital- and energy-intensive raw material firms favoured engineering companies such as Volvo, ASEA, Alfa-Laval and SKF (Sölvellet *al* [1991, pp. 81-82 and 114-115]). Inversely, the iron and steel industries in Sweden were favoured by investments in engineering (including ship building).

Thus, the raw material industries and large engineering companies were important for Sweden in the Golden Age not only through their large share of production and employment in manufacturing. They also acted as spiders in strategic industrial net-

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already in the mid 1930s when employment in foreign subsidiaries are accounted for (Wibe [1976, pp. 22-23]).

<sup>31</sup> Volvo's earlier strategy to extend its motor vehicle program and integrate backward continued in the Golden Age. The company required a producer of agricultural vehicle *Bolinder-Munktell*, in 1950. Volvo's backward integration strategy culminated with the take-over of a truck-cabin producer (given the name of *Volvo Umeverken*) in 1964 and a steel-pressing company *Olofström AB* from Alfa-Laval in 1969.

<sup>32</sup> Figures for AGA is also included in table 8. Some engineering companies such as Fläkt, Bahco and Esab are excluded since they were not large enough or owned by other large companies in the Golden Age. Swedish Match has been excluded on statistical grounds.

<sup>33</sup> The supplying firms, however, became more specialized in the interwar period (Dahmén [1950, pp. 239-241]).

works. Besides, the industries and companies under discussion had strong demand multiplier effects on other parts of the Swedish economy than supplying industries. In these respects, export was a more important activity than investment.

The raw material industries accounted for more than 60 percent of Swedish export value (for goods) immediately after World War II and in the early 1950s - ~~table 7~~. Their share of Swedish export then decreased steadily but was still 38 per cent in 1973. The sector's share of Swedish *net* exports was even larger since it predominantly uses domestic inputs. As a contrast, in Norway, the influence of raw material export on the rest of the economy is weaker because of high import shares of production costs.

The eight companies in engineering mentioned above accounted for 19 per cent of the Swedish export value in 1966 - see ~~table 9~~. The share increased to 22 per cent 1970 and to 24 per cent 1973. The increases were stronger than for engineering products as a whole primarily because of Volvo's and Saab(-Scania)'s export successes.<sup>34</sup>

Export became, together with housing demand and investment in construction, the main demand driving force in Sweden in the Golden Age. Surpluses in the current account were not counter-balanced by revaluations of the SEK (see the Bretton Wood system) and they also created room for expansive fiscal and monetary policies.<sup>35</sup> As a consequence, export from the leading companies had a strong impact on Swedish GDP in the Golden Age.

#### 4.2 Wage Leadership

The decisive influence of export on Swedish GDP has given the big companies in basic industries and, particularly, in engineering a wage-leading role. Other companies are forced to follow since they are anxious to keep key employees and also restricted by wage earners' care for *relative* wages. In the Golden Age, the relative wage preference was strengthened by solidaristic wage policy and also fairly easy to satisfy because of a growing scarcity of labour.

Wage leadership by the export sector is emphasized in the *Scandinavian wage model* formulated in the 1960s (Edgren, Faxén & Odhner [1970]). Here, central wage negotiations are not independent determinants but rather "collective replies" to wage increases for (key) employees in the exposed sector. There are no indications that the Scandinavian model became less valid for Sweden in the 1970s and 1980s (Holmlund [1990] and Warginger [(1992)]).

Wage leadership is important not only inflation but also for productivity and growth. Wage increases in large export companies lead to a cost pressure on other firms,

<sup>34</sup> The export figures for the raw material industries and the large engineering companies have not been added up since some engineering companies are also engaged in steel industry.

<sup>35</sup> Current-account deficits did emerge in the Golden Age since economic policies immediately after the war (1947-1949) and in the economic peaks of the late Golden Age were too expansive. But the deficits were rather small or of short duration.

including new ones. The cost pressure will result in higher productivity through either rationalizations in suffering firms or structural change. (The decline of less-effective firms and industries will release resources for the expansion of other firms and industries.)<sup>36</sup>

#### 4.4 The Production and Diffusion of Knowledge by the Large Engineering Firms

The Swedish innovation system in the Golden Age is a mixture between a fundamental system, settled already in the interwar period, and a “regulated” (collective) one which only partially could be distinguished before World War II. The two systems are complementary and reinforcing. In both, large established companies in engineering are the main producers and transmitters of new knowledge. The difference between the systems is that the first is based on early patterns of specialization and internationalization while the second one incorporates the institutions and means of the postwar policy model as defined in chapter 2.

The Swedish innovation model assumes that large firms produce a larger share of new ideas than other domestic firms, single inventors and universities. This assumption is confirmed by studies of major inventions during the Golden Age even when large firms are compared to all other inventors (Mc Queen & Wallmark [1983, pp. 48-49]) and Carlsson *et al* [1979, pp. 141-142]). I will also assume, that the inventive superiority of large firms primarily reflects the superiority of large companies in engineering. The theory has not been tested rigorously, but there are many indications of its validity (Mc Queen & Wallmark [1983, pp. 11-16, 28 and 42-49]). In addition, the spill-over effects of inventions in engineering are probably stronger than in other industries, for instance pharmaceutical industry.

An inventive superiority of large Swedish companies in engineering might be explained by their financial strength, facilitating R&D expenditures, their long market experience, producing new ideas by feedbacks from customers and competitors, and by scale advantages in R&D.

The inventive strength of Swedish engineering companies laid the ground for a strong *innovative* ability in the Golden Age. The companies’ inventive sovereignty might have been amplified by superior sale and development capabilities reflecting long market experiences or rich financial endowments allowing high expenditures on R&D and marketing. Their innovative vigour could also have been due to scale advantages in marketing and product improvements.<sup>37</sup> In any case, innovative superiority is one

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<sup>36</sup> In the Scandinavian wage model, productivity is exogenously determined.

<sup>37</sup> The inventive rather than the commercial superiority of large firms in Sweden is emphasized in a Swedish study (Mc Queen & Wallmark [1983, pp. 45-49]). Moreover, the size of R&D investments seemed to be a stronger comparative advantage of large engineering firms than R&D efficiency. The large engineering firms’ share of Swedish major innovations in the Golden Age (1945-1973) was 38 per cent which is approximately equal to their share of value added in manufacturing. The former share is 43 per cent if pharmaceutical firms are excluded. (My estimations are based on Mc Queen &

explanation why large established companies warranted a large proportion of new industries in Sweden in the Golden Age.

The innovative sovereignty of large engineering companies in Sweden is, to a large extent, based on extensive R&D activities and expenditures. The corporate sector accounts for a dominant share of R & D activities in Sweden. In addition, R & D investments are concentrated to the large companies in engineering and to pharmaceutical companies. (However, a similar concentration of R&D investments to the corporate sector and the large companies in manufacturing can be found in other OECD countries.) Moreover, approximately 90 per cent of total R & D expenditures in Swedish manufacturing has been financed by the companies themselves in the postwar period.<sup>38</sup>

#### 4.4.1 *The Fundamental Innovation System*

When the fundamental innovation system in Sweden is distinguished, I will not consider the *early* innovation process in engineering. Thus, I will ignore the mechanisms behind the establishment and early consolidation of firms in the first and second innovation wave. My focus is upon innovations ~~in~~ established companies in Swedish engineering, thus, upon secondary innovations or ~~the~~ *catching up* rather than making of leading companies in Sweden. In this perspective, the relationships ~~between~~ the large Swedish companies in engineering are of less interest. In the postwar period, there are few examples of secondary innovations in leading companies which can be attributed to qualified orders from or collaborations with ~~the~~ leading companies in engineering.<sup>39</sup> For instance, the technological links between SKF and the Swedish car producers have been weak. In contrast, SKF was a midwife at the birth of the Swedish car industry. Basic innovations in Scania(-Vabis) and Volvo can be related to product developments in SKF.

There are two fundamental impulses to innovations in large engineering companies in Sweden. The first impulse emerge through their “outwardness”, the other through natural conditions or the Swedish raw material industries.

The large Swedish companies in engineering assimilate and develop new ideas through their international connections. Demanding foreign customers and tough foreign competitors encourage product differentiation and the introduction of new technologies in the Swedish companies. Innovations by foreign competitors are

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Wallmark [1983, table 3]). There was, on the other hand, a strong correlation between R&D expenditures and major innovations in Swedish manufacturing in the Golden Age (Mc Queen & Wallmark [1983, pp. 43-44]).

<sup>38</sup> Statistics Sweden [1989, p. 21] and [1992].

<sup>39</sup> Alfa-Laval and Electrolux started some commercial and technical collaboration in the mid 1950s. SKF and ASEA co-operated in the mid 1960s to develop flexible steel producing methods. Saab, (LM) Ericsson and ASEA collaborated in space technology in the mid 1960s. Furthermore, Alfa-Laval and Volvo had some technical collaboration until 1969 as Alfa-Laval was a supplier of car bodies to Volvo.

imitated or simply appropriated through take-overs. Swedish transnational companies develop and acquire new ideas also by joint ventures together with foreign firms and the use of foreign suppliers.

It is misleading, however, to consider foreign orientation as the only fundamental force behind (secondary) innovations in Swedish engineering. For instance, Scania-Vabis made product innovations (and radical organizational changes) in the interwar period almost without any export at all until the mid 1930s.

Innovations in Swedish companies in engineering have been promoted by hard natural conditions. Product developments in electro-technical industry (ASEA) and in motor vehicle industry (Scania-Vabis and Volvo) were stimulated by long distances and severe climate. (The “regulated” innovation system has also been important for these companies.) Furthermore, Swedish mining conditions influenced Atlas Copco to develop light pneumatic drills with pusher legs, the so called Swedish method, which became a world-market success in the Golden Age (Janelid [1974, pp. 271, 287 and 292-293]). In addition, innovations in engineering industries can be related to other leading industries in Sweden. Product developments in Volvo, Saab, Atlas Copco, ASEA and SKF have been stimulated by qualified orders from and technical collaboration with Swedish raw material producers.

But I will consider foreign orientation as the most fundamental force behind product development in Swedish engineering in the Golden Age. Natural conditions and raw material industries were probably more important *before* the Golden Age.

The ideas produced or acquired by the large Swedish transnational companies are transmitted to their units in Sweden and to other Swedish firms. There are many possible mechanisms of transmission. For instance, employees in large engineering companies establish new firms on the basis of ideas acquired in their former employment. Moreover, new management theories are spread by central employer organizations dominated (at least from the early 1930s) by the large companies.

Due to firm concentration, new knowledges in the leading companies in engineering are spread to complementary, not competing, firms and to other industries *inter alia* supplying ones. Michael Porter has argued that many domestic producers in an industry are necessary to create a dynamic environment. In fact, he mentions the rivalry between Saab and Volvo (both passenger cars and trucks) as a good example (Porter [1990, pp. 117-122]). But here, Porter has found the exception of variety rather than the rule of solitude in Swedish engineering. The large companies are, with some exception, the only producers in their fields.<sup>40</sup> They illustrate that passionate struggles

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<sup>40</sup> ASEA, Separator and SKF had Swedish competitors for main products but they disappeared through take-overs and closures in the interwar period. Atlas Copco became the only Swedish producer of pneumatic equipment by the requirement of two producers of small compressors in 1942 and 1948 respectively. In addition, Scania-Vabis and Volvo have been the only Swedish producers of trucks and buses since the mid 1930s when a competitor closed down. Electrolux became the sole Swedish producer of vacuum cleaners in 1934 and, although much later, of refrigerators, freezers and electric cookers by take-overs of Electro-Helios in 1962, earlier controlled by ASEA, and Husqvarna in 1978. At the end of the 1970s, only one domestic white-good competitor to Electrolux remained, Cylinda (owned by ASEA until 1988), a producer of washing machines and dish washers. In all cases,

between domestic rivals can efficiently be replaced by competition between national champions, particularly if some of them have been formed, as the Swedish ones, by an outward strategy. The Porter model assumes that innovations are promoted by domestic competition and then spread by intra-industrial interactions and labour mobility. However, in Sweden, new ideas have traditionally been diffused by national champions to firms in other industries, including subcontracting ones.

The raw material industries are not only inspirers of new ideas in engineering in the Swedish innovation system. They are also receivers of new ideas, developed or transmitted by the large engineering companies. In addition, the use and development of new technologies and products in raw-material industries are speeded up by co-operation with and qualified orders from the large engineering companies (Janelid [1974, pp. 278-279 and 306] and Schön [1990, pp. 40-41, 59 and 81-82]).

The relations in the fundamental innovation system are one-sided if the large companies in engineering and basic industries are added up. Knowledge produced or assimilated by these companies is spread to other companies in Sweden but not the other way round. Here, some obvious cases where small and medium sized firms in engineering have played a innovative role in Sweden are ignored. The fundamental innovation model does not exclude that new ideas are developed by small domestic firms. However, the model assumes that new ideas are ~~are~~ commercialized by established large companies by appropriation, either of the ideas or of the small firms themselves. Established companies' requirement of dynamic new firms is one reason behind the few amendments to the group of large companies in Sweden, a pattern already fixed in the interwar period.<sup>41</sup>

#### 4.4.2 *The Regulated Innovation System*

In the “regulated” Swedish innovation model, governments, both central and local, and public agencies are main actors together with established large companies in engineering. Innovations in the latter companies were brought forth by the following devices in the Golden Age;

- Regulations, primarily related to housing standards, energy consumption and investment, safety and environment (including work environment).
- Qualified public orders.
- Technical co-operation with public authorities.
- Economic policy including tax policy.

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however, the noticed companies were branch-leading even before the time of “domestic monopoly” (or “domestic oligopoly” as in the case of Swedish car industry).

<sup>41</sup> For instance, ASEA required the major share of Fläkt in 1933 and incorporated Electro-Helios in 1936.

It can be objected that innovations in other Swedish (engineering) companies than the large ones have been promoted in the postwar period by public orders, technical co-operation with public agencies and regulations. Another possible objection is that domestic producers have been favoured by government purchases and economic policies in other countries as well. Thus, the Swedish “regulated” model of innovation is not unique.

It is true that small and medium-sized firms have participated in public systems of innovation in Sweden in the postwar period. But the co-operative and monopsonic character of public demand favoured large suppliers. Furthermore, there are several reasons why the regulated model was more valid for Sweden than for most other OECD countries in the Golden Age apart from the obvious one, that public sector growth (whatever measure is chosen) was stronger in Sweden than in other OECD countries (with the exception of Denmark) in the 1960s and the 1970s.

First, Swedish large companies in engineering are specialized in investment goods, or more exactly *inpublic* (infra-structural) investment goods. ASEA (electro-technical equipment) and Ericsson (tele-communications) are the best examples.<sup>42</sup> Second, the large Swedish companies in engineering were strongly favoured by military rearmaments in Sweden after World War II. As a result, a modern aircraft industry (including a civil division) was built up by Saab and jet engines were developed (independently) by Volvo and ASEA in close co-operation with Swedish defence authorities. Furthermore, strong demand from defence during and after World War II induced Scania-Vabis (later SAAB-Scania) and Volvo to develop durable cars, heavy trucks and buses. It also led to the development of radio-communication systems by Ericsson.

Third, the “regulated” innovation model was exceptionally important in Sweden in the Golden Age since welfare policies stimulated demand of standardized consumer goods. For instance, the strong priority of decent housing in Sweden favoured large producers of household appliances such as Electrolux. The so called Million Programme 1965-1974, that is, the Social Democratic attempt to put an end to low-quality living and housing shortage, was extremely important for domestic white-good producers. White-good consumption grew significantly more than total private consumption in the late Golden Age (cf. [table 13](#)). However, the Million Programme’s effects on product renewal in white-good industry were probably limited.

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<sup>42</sup> A collaboration between ASEA and the Swedish State Power Board (Vattenfallsstyrelsen) resulted in a high-tension transmission system adapted for the water power station Harsprånget built in 1952. Similar transmission techniques were later used in other countries. A similar collaboration with public authorities induced ASEA to start a production of nuclear power in the 1950s. ASEA became both a technological leader and a supplier of nuclear power in Sweden in the 1960s. In fact, the company built nine of twelve nuclear plants in Sweden (Glete [1987, p. 278] and Schön [1990, pp. 82-83]). A technical collaboration between Ericsson and the Swedish Telecommunication Administration (Televerket) from the early 1970s led in the middle of the decade to the introduction of a pathbreaking digital switching technology, the so called AXE system (Sölvelöv *et al* [1991, pp. 117-118]).

Innovations in large engineering companies were stimulated also by stabilization and tax policies in the Golden Age. It is assumed here that innovations are promoted by high domestic demand or facilitated by internal saving. Import regulations are also included in my notion of stabilization policies. It is assumed here, that product developments are promoted by the escape of superior foreign competition, at least for a limited period.

## Chapter 5 - The Performance of the Swedish Model in the Golden Age

### 5.1 Threats, Opportunities and Reactions I - The Large Engineering Companies

Large Swedish companies in engineering experienced a tremendous success in world markets in the Golden Age. Established companies such as Alfa-Laval, Atlas Copco, Ericsson, SKF, AGA and ASEA succeeded not only to preserve but also to strengthen their technological and commercial positions, Carlsson *et al* [1979, pp. 138-154].

Scania-Vabis and Volvo were among the world's largest producers of buses and heavy trucks in the Golden Age. They became technological leaders by developments of the turbo engine already in the early 1950s. Where private passenger cars are concerned, the expansion of Volvo and Saab was not curbed by the fact that they were small producers in standardized markets. For instance, the turbo engine for private passenger cars was mainly an innovation by Saab in the first half of the 1970s.

Electrolux strengthened its position as a large producer of vacuum cleaners on the world market in the Golden Age. In addition, the company strove successfully to extend its white-good programme from refrigerators to washing-machines, refrigerators, freezers, electrical stoves and dish washers and for a position as a domestic monopolist. Electrolux did not become a world leading producer in the Golden Age but the company's strategy to "buy market shares" was shaped by domestic take-overs. The strategy was brought to perfection in the 1970s and the 1980s when Electrolux gained a strong oligopolistic position on world markets for white products.

Swedish companies in engineering were favoured in the Golden Age by the rebuilding of Europe and liberalization of trade *inter alia* through GATT and EFTA agreements from the late 1950s. Swedish engineering had a favourable regional and product composition of its export at least until the mid 1960s<sup>43</sup>. In addition, Swedish companies were favoured by the fact that Sweden was one of the few European countries that had not participated in World War II.

But favourable external conditions are no guarantee of business success. Besides, market conditions were not unambiguously favourable for Swedish engineering in the Golden Age. First, trade extensions and a rapid diffusion of new knowledge resulted in a hard competitive pressure on large Swedish companies in engineering already in the 1950s. Swedish companies competed mainly with Anglo-Sachian companies which had been less hit by the war. (Here, Saab, Scania-Vabis and Volvo are the clearest exceptions.) Besides, Swedish companies were large in relation to other Swedish companies but not in relation to foreign companies. Scale advantages of foreign competitors were often stronger in marketing, R & D, distribution and finance than in

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<sup>43</sup> Export demand from the EFTA countries was high in the first half of the 1960s. However, the regional composition of Swedish export of engineering products became unfavourable from the mid 1960s (Mjøsetet *et al* [1997]).

production.<sup>44</sup> Moreover, researchers disagree whether large-scale production technologies became more or less important in the Golden Age. In any case, there were strong incitements at least for Swedish suppliers of consumer durables to adapt large-scale technologies as markets were enlarged, standardized and penetrated by foreign companies with absolute scale advantages.

Second, leading Swedish companies were hit by market saturation in the Golden Age. A theory that *export market* growth of the leading Swedish companies became lower in the late Golden Age is not unambiguously confirmed by empirical research.<sup>45</sup> But it is obvious that many *domestic* markets were exhausted, especially in the 1960s.<sup>46</sup>

Large Swedish companies, however, had the qualifications to meet the challenges in the Golden Age. They were often more accustomed to free trade and foreign competition than rivals from large Western countries. Trade restriction in the 1930s and 1940s were parentheses for Swedish companies which had been developed on the premises of foreign sales. Even ASEA, the most home-market orientated company from the first innovation wave, was more outward (and specialized) during the Golden Age than foreign competitors.

“Early outwardness” facilitated Swedish companies’ take-over of foreign companies and their management of subsidiaries outside Sweden. There was a sharp increase in direct investments abroad by Swedish companies in the 1950s and the 1960s. The companies expanded predominantly abroad by take-overs (SOU 1982:27 [1982, pp. 69-72 and 113-115]).

In addition, the probability to become a Swedish champion in the Golden Age was raised if the companies had a long experience of export and foreign production. Electrolux became a national champion for white goods, primarily by take-overs, in the Golden Age. The main difference between Electrolux and its Swedish challengers was that Electrolux was much more outward. Analogously, Electrolux’ foreign experiences is an important explanation of why the company got a world leading position for white goods (mainly by take-overs) in the 1970s and the 1980s.

Leading Swedish companies did respond to harder international competition not only by take-overs but also by mergers. A merger between Saab and Scania-Vabis in 1969

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<sup>44</sup> However, Atlas Copco became the world’s second largest manufacturer of pneumatic products in the early 1960s (Ramström [1974, p. 344]).

<sup>45</sup> Mjøset *et al* [1997] do not show that the product composition effect of engineering on Swedish export market shares was unfavourable from the mid 1960s particularly not *ships* are excluded (see also Hultén [1988, pp. 194-195]). However, a more detailed study has added *refrigerators* to the group of engineering products with a low export growth (Hultén [1988, p. 220]). Beside, a study of the large engineering companies in Sweden confirmed a theory that the most outward companies (companies with the largest foreign production) experienced the lowest export growth. The study covers not only the Golden Age but also the 1975-1983 period (Hultén [1988, pp. 196-202]).

<sup>46</sup> For instance, growth of private consumption expenditures on new cars (constant prices) decreased significantly in Sweden in the 1960s. In fact, it became lower than growth of total private consumption expenditures in the 1963-1973 period - see table 13.

reflected a need to use economies of scale in production, R & D, marketing and administration but also to stabilize demand for the two companies. (However, the hopes of scale advantages were largely dashed.)

Large Swedish companies raised their R&D expenditures significantly in the 1960s and early 1970s to meet the challenges from foreign competitors. As a consequence, civil R & D spending as a percentage of GDP increased more in Sweden than in most other OECD countries (Fagerberg [1987, p. 122]). R & D efforts were probably stronger in large Swedish companies in engineering than in competing foreign companies.<sup>47</sup>

R & D expenditures were important for the success of Swedish companies in the Golden Age. But the overwhelming majority of innovations was made abroad. Large Swedish companies were fast to use both flexible production technologies, industrial robots and new rationalization instruments such as the MTM system.<sup>48</sup> They had been equally efficient in the interwar period to catch up large-scale innovations from the U.S such as the assembly line and scientific management (Taylorism).<sup>49</sup> The fast Swedish “catch-up” after World War II is largely explained by international networks established by the large companies in engineering.

The incitements in large Swedish companies to rationalize were raised in the 1960s due to harder external pressure and “aggressive” market strategies to conquer world markets (see Electrolux in particular). Organizational changes in Swedish engineering were still mostly of a “Fordist” nature leading to work specialization rather than to work differentiation (Carlsson *et al* [1979, p. 129-130]). Cost-reducing programmes were accomplished not only for single plants. ASEA and Electrolux in particular concentrated production by plant specialization.

Furthermore, the large Swedish companies in engineering reacted in the 1960s on tight international competition by specialization on “core products” - often their basic innovation - and economies of scope within the core.<sup>50</sup> An important part of the strategy was to sell out or close divisions with weak commercial or technological links

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<sup>47</sup> This is indicated by figures on R & D expenditures as a ratio of sales values in 20 manufacturing industries in Sweden and six other OECD countries (Japan, West-Germany, France, Great Britain, Italy and Belgium). The ratio is exceptionally high for Sweden in industries dominated by large companies. Unfortunately, there are only figures for 1985 and 1987. Statens Industriverk [1990, p. 82].

<sup>48</sup> Carlsson [1988, pp. 22-23], Statens industriverk [1988, p. 63] and Giertz [1991, pp. 257-262].

<sup>49</sup> Dahmén, 1950 [1950, pp. 360-367 and 381] and Giertz [1991, p. 150]. European countries in general had been slow to catch-up new U.S technologies in the interwar period (Fagerberg [1994, p. 1158]).

<sup>50</sup> The strategy seems to contradict the Swedish innovation model where large companies' entries in new industries are noticed. However, new industries were mainly penetrated by the most home-market orientated companies, Saab(-Scania), Volvo and ASEA, in the late Golden Age. In fact, ASEA combined a “diversification” and core strategy by both expanding in new industries (*inter alia* industrial robots) and putting a stronger emphasize on established products. ASEAs strategy implied that the company closed or sold units operating on stagnating markets or with weak technological links to the rest of the company.

to the core business. In the course of time, some of the companies had become general dealers rather than specialists<sup>51</sup>

It is true that the core strategy of Swedish companies increased their dependency of single products. Besides, several core products experienced a relatively low market growth in the Golden Age. But the companies expected that any tendency of market saturation would be counter-balanced by a stronger market position. The hopes were not ungrounded. The Swedish companies had procured a large capability to compete in particular (even standardized) segments of the world market.

Tendencies towards market saturation for core products might have contributed, as harder international competition, to R & D and rationalization efforts by large Swedish companies in the 1960s and early 1970s. Such tendencies also induced the companies to adjust to fast-growing regions abroad and to search for new uses of their core products. It seems that the large Swedish companies in engineering were successful in these respects.<sup>52</sup>

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<sup>51</sup> Alfa Laval sold its steel pressing company Olofström AB (to Volvo) in 1969. Furthermore, AGA abandoned in the early 1970s its postwar strategy to diversify outside its “core”. The company had become a producer of medical equipment, home-electronics, radiators and batteries in the 1960s. ASEA sold its household product company, Electro-Helios, to Electrolux already in 1962. Furthermore, ASEAs production of welding equipment and elevators was laid outside the company in the 1960s although ASEA maintained its control by remaining as a predominant owner. The “core strategy” of the large companies in the late Golden Age implied in some cases that an earlier specialization pattern was confirmed. SKF experienced tendencies towards market saturation and harder international competition (primarily through a Japanese challenge) in the early 1970s. The company’s strategic decision was to remain in ball-bearings, not to broaden its product programme. Atlas Copco had already specialized in pneumatic products in 1948 when the company abandoned its (unprofitable) production of diesel engines. Technological progress by competitors in the 1950s, eliminating the comparative advantages of “the Swedish method”, *did not* lead to a decision by Atlas Copco in the 1960s to market products alien to the core business. Electrolux seems to contradict the thesis of product specialization. The company expanded in markets for white-goods and cleaning and garden equipment in the 1960s and early 1970s. In fact, stoves were not included in the company’s product programme before the requirement of Electro-Helios. However, Electrolux’ ambition was to enlarge its household assortment to products with strong commercial and technological links to its “core” and to become a Swedish (and Scandinavian) monopolist for white goods. Electrolux’ core strategy is confirmed by the fact that it closed down a “peripheral” production of warm-water radiators (inherited from Electro-Helios) by selling the business division to AGA in 1971.

All large companies in Swedish engineering did not choose a specialization strategy in the 1960s. Swedish Match’s ambition to diversify (mainly through take-overs) in the Golden Age *was* ~~is~~ *realised* in the late 1960s. Besides, the merger between Saab and Scania-Vabis *was* ~~is~~ *inter alia* an attempt to reduce the companies reliance on private passenger cars and trucks/buses respectively. However, a decision had earlier been made by Scania-Vabis to abandon a diversification into light trucks, tractors and cars.

<sup>52</sup> Estimations of changes in countries’ share of world trade do not unveil a strong regional flexibility of Swedish engineering in the late Golden Age (Mjøseth *et al* [1997]). But the estimations are too aggregate to discern the flexibility of leading companies. Firm-specific information shows that companies such as Atlas Copco and AGA succeeded to find new industrial applications of their core products. Furthermore, ASEA reduced *inter alia* by product differentiation, its reliance on government authorities in energy in the 1960s by significant sales to industries, households and public authorities in transport.

Limitations of the Swedish market led, together with trade liberalizations (and other reductions in trade barriers), to a strong increase in sale efforts abroad by large Swedish companies. The foreign share of their total sales was raised considerably in the 1960s, see [table 10](#). The increase was remarkable for two companies with a strong reliance on domestic markets in the early Golden Age, Volvo and ASEA.

Volvo and ASEA first became outward in the 1960s and early 1970s if we classify a company as outward when foreign sales exceed domestic sales. Volvo, and also Saab, could benefit from the fact that world demand growth for cars became higher than for most other products in the late Golden Age (Mjøsøtt *al* [1997]). Swedish producers of private passenger cars succeeded to make significant inroads into the U.S market already in the second half of the 1950s. Volvo became Sweden's largest export company in the early 1960s<sup>53</sup>.

The success of the large Swedish companies in the Golden Age has been related to their early "outwardness". A long experience of competition on foreign markets and of establishing subsidiaries abroad gave a real competitive advantage of Swedish companies. Virtuous circles did also arise in the late Golden Age as the earlier success of Swedish companies facilitated the financing of take-overs and of investments in R & D and marketing.

It is true that Saab and Scania-Vabis were successful in the Golden Age without any long experience of export. But they recruited managers from the large Swedish transnational companies (Giertz [1991, p. 297-298 and 325-326]). In addition, industrial capitalists such as the Wallenberg family acted as an intermediater of experiences from early outward companies to companies which were latecomers on the world market.

But it is wrong to reduce the success of Swedish companies in the Golden Age to one variable only, "early outwardness". References must be made also to high managerial skill (unrelated to foreign experiences) especially in the case of Electrolux from the mid 1960s. Furthermore, the major industrial owner, the Wallenberg family, permitted long investment horizons in the leading Swedish companies. The family's position as major owners also facilitated the merger between Saab and Scania-Vabis. The validity of an ownership theory of the Swedish success is, however, restricted by the fact that companies outside the Wallenberg sphere, often with more passive owners, such as AGA and Volvo were fortunate (and foreign orientated) as well.

Political factors contributed to the success of large Swedish companies in the Golden Age. The Swedish innovation model offers one political explanation. Product developments induced by qualified public demand, particularly in Ericsson, ASEA, Volvo, Scania-Vabis and Saab, opened the gates to international markets. The neutrality of Sweden was another factor behind the success of Swedish companies. It made it easier for Swedish companies to get foreign orders from and establish foreign

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<sup>53</sup> In the late 1950s, private passenger cars became Volvo's main products (in value terms) even if trucks and buses are put together.

subsidiaries in underdeveloped countries. Thus, the importance of “luck” for the Swedish success shall not be completely ignored.

Firm size is another explanation of why Swedish companies in engineering were fortunate in the Golden Age. Small size was not always a disadvantage of Swedish companies as it often made them more flexible. For instance, contacts between marketing, R & D and production departments were facilitated. Such contacts made it easier for Swedish companies to adjust research and production to new demand patterns.

## 5.2 Threats, Opportunities and Reactions II - The Raw Material Industries

Sweden’s specialization on raw material industries resulted in high export growth immediately after World War II. The industries gained by excess demand and high product prices especially during the Korean War.

However, the Swedish saw mills and steel producers were soon exposed to hard international competition. The Swedish steel companies were hit by foreign competitors’ use of new technologies already in the late 1950s. They had, as the Swedish saw mills, a vulnerable vintage structure as investments by foreign competitors which had suffered from the war embodied the latest technology. The number of plants in Swedish wood product and steel industries decreased sharply already in the late 1950s.

The competitive pressure on Swedish iron and steel industries was intensified in the 1960s. In particular, Japan and, later, newly industrialized countries, began to penetrate Western markets for iron and steel products.

The Swedish iron and steel industries and saw mills were accustomed to hard foreign competition. Already in the 1890s, Swedish iron and steel industries had pursued quality up-gradings to meet competition from larger European countries which benefited from cheaper inputs and economies of scale. Similar up-gradings took place, although with a delay, in saw mills *inter alia* through integration with pulp production.<sup>54</sup> In the 1920s, tough international competition led to both product differentiation and the introduction of new technologies in saw mills and in iron and steel industries.<sup>55</sup>

In contrast, Swedish pulp and paper industries had not faced any strong international competition before World War II. In fact, they were first hit by a strong competitive pressure in the mid 1960s. Now, North American competitors, helped by reductions in sea-transportation costs, invaded European markets. Above all, North American producers sold off surpluses when demand was weak on their domestic markets.

<sup>54</sup> Dahmén [1950, pp. 169-171 and 304-310], Jörberg [1961, pp. 70-71 and 83-84] and Glete [1987, pp. 198-204].

<sup>55</sup> Dahmén [1950, pp. 127 and 157-161].

Furthermore, Finland - the main European competitor to Sweden in pulp and paper industries - devaluated in 1967.

Productivity growth was raised considerably in Swedish raw material industries in the 1960s.<sup>56</sup> High demand growth in the first part of the 1960s offered great opportunities to use scale advantages. It also led to high investments embodying new technologies (both in older and newer plants).

The ability of the raw material industries to show high productivity growth was reduced during the second part of the 1960s by successively higher productivity *levels*. Moreover, the possibilities to exploit scale advantages were *ceteris paribus*, impaired by a lower demand growth. But productivity growth was sustained in basic industries mainly because of rationalizations (including mergers), plant specialization and eliminations of inefficient vintages.

It seems that transformation pressure rather than new opportunities (commercial, technical or financial) was the driving force behind the large productivity increases in Swedish raw material industries in the latter part of the 1960s. Pressure was raised primarily through tougher international competition and lower demand growth.<sup>57</sup> A harder international competition was partly triggered off by an international recession in the mid 1960s (cf. pulp industry above). There was also a stronger wage pressure on some raw material industries (mainly saw mills) through wage leadership by large export companies, solidaristic wage policy and a growing labour scarcity.

A merger (and take-over) boom occurred in Swedish manufacturing particularly in raw material industries during the second half of the 1960s. Mergers contributed strongly to productivity growth in manufacturing in the 1960s.<sup>58</sup> In the raw material industries, mergers were primarily induced by tight international competition and recessions (Rydén [1971, pp. 198-206]). The potential for mergers was large since they had been postponed in the 1950s due to high profitability.

The room for “enforced” productivity increases was *huge* *general* in Swedish basic industries in the mid 1960s particularly in pulp and paper industries where the competitive pressure had been weak for so long (Wohlin [1970, p. 109]). Paper and pulp producers could handle harder international competition rather efficiently in spite

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<sup>56</sup> It seems that the increase in *labour* productivity growth was explained more by a higher growth in capital intensity than by an increase in total factor productivity growth (cf. Wohlin, [1970, p. 108]). However, mechanisation is often associated with technological progress.

<sup>57</sup> There was no significant positive relationship between international competition and the use of production slacks (X-inefficiencies) in 1968 according to a cross-sectional analysis of 26 Swedish manufacturing industries (Carlsson [1972]). However, the argument about rationalizations above concerns *changes* during the Golden Age and raw-material industries only. Besides, the measures of international competition at the study were rather crude.

<sup>58</sup> Estimations have shown, that 25 per cent of productivity increases in Swedish manufacturing 1966-1969 is explained by mergers - the corresponding figures for the 1951-1969 period are 15 per cent. The raw material industries' share of total mergers in Swedish manufacturing 1966-1969 was 35 per cent if printing and publishing branches are included, see Rydén [1971, pp. 55 and 148].

of weak experiences of such pressure. Productivity growth was higher in pulp and paper industries than in other basic industries in the second half of the 1960s.

The conclusion that Swedish pulp and paper industries were able to meet the challenges of the 1960s is not obvious. First, their high productivity growth was to a large extent explained by “capitulate” plant closures.<sup>59</sup> Second, the potential for productivity increases was large. Third, the pulp and paper industries were the only industries in Sweden, beside ship building, which experienced large losses of market shares in the second part of the 1960s.

But the erosion of market shares in pulp and paper industries was larger for Finland than for Sweden. Swedish pulp and paper producers did also regain large shares before the Golden Age was over.<sup>60</sup>

Finally, plant closures and losses of market shares for raw material industries were clear expressions of structural change in Swedish industry. There were no large losses in *aggregate* market shares for Sweden in the 1960s and early 1970s in comparison to subsequent periods. The total losses of world market shares in the second part of the 1960s were of equal size for Norway and Finland and much larger for Denmark (and Iceland), Erixon [1988, pp. 13] and Mjøset *et al* [1997].

Another indication of structural change in Sweden during the late Golden Age was the switch in export from staple raw-materials to finished goods. The group of unfinished goods, according to the SITC classification in trade statistics (group 1-4), includes agricultural products, wood products from saw mills, pulp and ore. The finished goods (SITC group 5-9) raised their share of Swedish export with 9 percentage points 1963-1973 in spite of a “raw material boom” in 1973. The increase was larger than in most other OECD countries (Horwitz [1979, p. 43]).

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<sup>59</sup> According to Lars Wohlin, the increase in productivity growth in Swedish pulp industry during the second half of the 1960s is fully explained by the fact that more plants with low productivity were closed (Wohlin, [1970, p. 109]). Official statistics show, however, that labour productivity growth in pulp and *paper* industries was least as high in the first as in the second part of the 1960s (Erixon [1987, p. 223]).

<sup>60</sup> Mjøset *et al* [1997] and Erixon [1988, pp. 13-17]). Iron and steel industries must be added to the group of Swedish industries with large losses of market shares if only the 1969-1973 period is considered.

## Chapter 6 - The Coherence of the Swedish Model

The leading industrial sector succeeded to establish high growth in Sweden in the Golden Age. The sector showed high export and productivity growth and was able also to both generate strong demand multiplier effects and to spread new knowledge. New ideas were primarily produced or transferred by the large companies in engineering. For instance, the ideas of scientific management, applied by companies of the Swedish model already in the interwar period, were rapidly spread in Swedish manufacturing after World War II (Giertz [1991, pp. 158-159]).

The success of the large companies and dominant export branches was a necessary condition for the coherence of the Swedish model. But the postwar model also assumes that profitability in the leading industrial sector was kept up by economic policy. In fact, Saab, Volvo and Electrolux would hardly had grown to large companies in the Golden Age without a prosperous combination of public orders, regulations, welfare reforms, tax advantages and expansive economic policies.

A statement that capital accumulation in the leading industrial sector was supported by economic policies in the Golden Age must, however, be qualified. First, there were other domestic driving forces at the macroeconomic level. Independent of economic (and welfare) policies, there was a strong demand for private passenger cars, housing, household appliances and home electronics (wireless and television sets and gramophones). Household demand was particularly strong immediately after the war but it was stabilised on a high level by high birth-rates, rising real wages and the breakthrough of new social values, “the American Way of Life”.

Second, the contributions from economic policy to capital accumulation in the Golden Age did not mean that policy makers in Sweden were put under a permanent pressure from leading companies and share holders to offer them privileges. A theory that economic policy measures were enforced by the leading industrial sector is, for instance, refuted by the fact that large engineering companies were reluctant to a Swedish devaluation in 1949<sup>2</sup>.

It is true that formal meetings were held 1960-1964 between the government and representatives from big business, a co-operative arrangement called “Harpsund

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<sup>61</sup> However, corporatist arrangements in the labour market contributed independently to the extensive use of scientific management in Swedish manufacturing in the Golden Age. A judgement by the *Labour Court* in 1944 made piece-work studies compulsory in Swedish engineering (Giertz [1991, pp. 160-161]).

<sup>62</sup> Söderpalm [1976, p. 150]. The opinion that a devaluation would lead to “export without effort” was also shared by the Wallenberg family according to unofficial statements by the family’s economic advisor in the Golden Age, Erik Dahmén.

Democracy” in Sweden. But the real impact of the Harpsund meetings should not be exaggerated.<sup>63</sup> More important, there was a strong conviction in Sweden among leading Social Democrats and trade unionists in the Golden Age that growth was stimulated by export, large companies and industrial concentration.<sup>64</sup>

Besides, the biased character of the profit tax system were not always known by politicians or governmental experts and the priorities of full employment and redistribution were seldom related to industrial dynamics. Keynesianism was a short run strategy to obtain a full utilization of human and physical resources, not a tool to develop a Swedish mass-consumption industry in the interest of labour and large companies. Swedish economic policies in the Golden Age cannot be “explained” *entirely* by regards to dominant business interests.

But I will not abandon a theory that the leading industrial companies had an impact on economic policy in the Golden Age. First, *at some* occasions, the leading companies persuaded the government to offer them favours (Söderpalm [1976, p. 150]). Second, the *lack* of a strong pressure from industry on policy makers is, in fact, a confirmation of a theory that economic policy was determined by the interests and attributes of the leading industrial sector. The sector was differentiated enough to prevent that specific export interests became decisive for economic policy and that serious economic imbalances appeared in Sweden raising political claims *ad hoc* measures to favour the sector.

For instance, Sweden’s more differentiated industry explains the absence of an inflationary Finnish (or Icelandic) devaluation cycle in the Golden Age. Swedish economic policy could not be adjusted completely to the claims of the raw material industry. Moreover, Sweden’s diversified export sector prevented large current-account deficits and losses of market shares during the second half of the 1960s. In Finland, the need of a devaluation was stronger as raw materials had a larger weight of export.

## 6.1 The Embryo of the Swedish Model

The Swedish model did not suddenly appear after World War II. Its birth can be dated, with some reservations, to the 1930s. The Social Democrats formed stable governments with a parliamentary support from the Agrarian Party from 1932 and the LO was ultimately considered as an established social partner through the Saltsjöbaden agreements. In addition, economic policies in the 1930s were benevolent for industries here associated with the postwar Swedish model.

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<sup>63</sup> The leading industries had become more antagonistic in the late 1940s as there were some indications of an active growth policy by the Social Democrats and propositions of higher profit and wealth taxes. However, the militancy of the large outward companies was soon replaced by a more co-operative attitude primarily reflecting a Social Democratic return to a passive growth policy.

<sup>64</sup> This is illustrated by the postwar economic programme of the Swedish labour movement (1944) and the subsequent discussion among leading Social Democrats about industrial and employment policies.

Independent of Social Democratic policies, the SEK was depreciated 1931-1933 (after the abandon of the Gold Standard). The depreciations were favourable for Swedish raw material industries.<sup>65</sup> They did also benefit the new consumption industries. An undervalued SEK resulted in a strong comparative advantage of Swedish producers of consumer goods in home markets. In the 1930s, total Swedish import increased with 17 per cent (value) while Swedish import of consumer goods ~~decreased~~ increased with 15 per cent (Lundberg [1945, pp. 22-23]).

The depreciations did also stimulate domestic demand for consumer goods by making the Swedish economy more liquid. The pressure “upwards” on the rate of interest to obtain balance of payment was eased. Lower interest rates promoted demand for durable consumption-goods both directly and indirectly by higher investment in construction.

The consumption industries were favoured also by a counter-cyclical, generally expansive, fiscal policy from the early 1930s.<sup>66</sup> The more expansive effect of fiscal policies in the 1930s compared to the 1920s reflected higher public sector growth rather than larger budget deficits (Bergström [1969, p. 49]). Demand for durable consumption goods was stimulated and stabilized by pension reforms, household transfers (including unemployment insurances) and housing subsidies.

The importance of fiscal policies for aggregate demand in Sweden in the 1930s should not be exaggerated. Depreciations of the SEK and expansive monetary policies had probably stronger effects on GDP and employment. Besides, the depreciations made room for expansive fiscal and monetary policies.<sup>67</sup> In addition, real wage increases were more important for consumer demand than fiscal policies. High real wage growth in the 1930s did not primarily reflect strong labour (see the Swedish model) but the diffusion of new technologies.<sup>68</sup>

Depreciations and expansive economic policies led to high domestic demand for Swedish consumer-good companies in the 1930s. Moreover, foreign penetrations of Swedish markets (and a more export-orientated strategy of Swedish companies) were blockaded by protectionism. Fierce foreign competition on domestic markets might have destroyed the fragile Swedish consumer-good industries in their childhood. Together with protectionism, Keynesianism (and depreciations) was probably the right thing in the right time for companies in the second innovation wave.

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<sup>65</sup> Depreciations did also occur in other Western countries but not as early as in Sweden (or Great Britain).

<sup>66</sup> Fiscal policies were restrictive in the second half of the 1930s to avoid overheating.

<sup>67</sup> Improvements in the current account, *inter alia* reflecting an undervalued SEK, did also lead to increases in liquidity and reductions in the rate of interest when the SEK was finally tied to the pound in 1933 (Bergström [1969, pp. 31 and 45]).

<sup>68</sup> Membership in the LO increased rapidly in the interwar period (D’Agostini [1987, pp. 16-18]). But the rate of unemployment, a valid determinant of labour strength, was above 9 per cent even in the late 1930s.

Expansive economic policies in the 1930s did also stimulate companies in the first innovation wave. This was particularly true for producers of infra-structural and construction equipment such as ASEA and Atlas Copco. However, for Atlas Copco, the home-market orientation of the 1930s was a temporary departure from a fundamentally outward strategy, not a natural phase in the company's product cycle.

Profitability and profit shares (of value added) in Swedish manufacturing increased in the 1930s (Jungenfelt [1966, pp. 35-36] and Wibe [1976, p. 27]). The increase reflected a favourable combination of high foreign demand, selective protection<sup>69</sup> and expansive economic policies, depreciations and weak labour. Furthermore, industrial profits were raised rather than squeezed by the diffusion of new technologies. In accordance with the Swedish innovation model, new knowledges were primarily spread from one industry to another (Dahmén [1950, 378-379]).

Higher profits largely explain why internal saving became the most important source of industrial investment in the 1930s (Dahmén [1950, pp. 380 and 396]). The importance of plough-back profits was raised by a new corporate tax system in 1938 where free depreciation allowances for machines and equipment were permitted. The Swedish generosity of tax allowances was striking even in an international perspective. The new corporate tax system was particularly benevolent for large and capital-intensive companies. It virtually weakened the outward large companies' hostility to Social Democratic governments.<sup>70</sup>

In the 1930s, it is too early to talk about a Swedish model as defined in chapter 2. Labour was still too weak and consumer-good companies were not yet able to work as growth engines. But stabilization and tax policy routines of the early postwar period could already be distinguished in the decade.

## 6.2 Economic Policies in the Golden Age

Economic policies in the Golden Age had the same parliamentary basis as in the 1930s. Social Democrats formed governments during the whole period. The Agrarian Party (later the Centre Party) joined the Social Democrats in a coalition 1951-1957.

### 6.2.1 *The Early Golden Age*

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<sup>69</sup> Trade restrictions favoured Swedish home market industries but they did not prevent Swedish export of raw materials.

<sup>70</sup> The managers of ASEA, Electrolux, LM Ericsson, Separator (Alfa-Laval) and SKF were members of a political pressure group 1933-1953. (AGA joined the group in 1941.) The group first opposed the Keynesian policy of the Social Democrats but also the "neutral" employer strategy manifested by the Saltsjöbaden agreement, Söderpalm [1976].

After World War II, the raw material industries were favoured once again by economic policies. The devaluation of the SEK in 1949 engendered a comparative advantage of Swedish basic industries (and mining<sup>71</sup>). In particular, it delayed the invasion of Western European markets by North-American pulp producers. Furthermore, the absence of a revaluation of the SEK during the Korean War created a profit boom in Swedish raw material industries.

The raw material producers benefited also, at least up to the mid 1950s, by generally low rates of interest and, during the whole Golden Age, by the fact that falling energy prices were not neutralised by tax increases (cf. Schön [1990, pp. 30-33 and 75-76]). Finally, capital-intensive industries such as the raw material ones were not seriously hit by “full” employment policies (see below).

Swedish engineering gained from the 1949 devaluation as well. In fact, as in the 1930s, Swedish producers of consumption goods were favoured by a combination of an undervalued SEK and import restrictions.

Import restrictions were implemented in Sweden in 1947 to reduce current-account deficits caused by expansionary monetary and fiscal policies (and a revaluation of the SEK the year before). The restrictions, which were not removed until 1954, were of utmost importance for the Swedish car industry. They led, together with the 1949 devaluation, to a strong reduction in import growth of both cars and of components used by foreign car producers with assemblies in Sweden. For instance, car import (in value) *decreased* by 7 percent 1950-1952 when *total* import increased by 47 per cent - [table 14](#). As a consequence, Volvo and Scania-Vabis got a strong position on Swedish markets for trucks which they sustained during the whole 1950s. Import restrictions did also favour Swedish producers of private passenger cars since domestic demand was decisive in their first expansive phase until the late 1950s. They contributed strongly to the fact that Volvo replaced Volkswagen as the most sold car in Sweden in 1956.<sup>72</sup>

Import restrictions did also benefit Swedish suppliers in car industry. A large number of new supplying firms, entirely depending on orders from, Volvo, Saab and Scania-Vabis, was established in the late 1940s and the early 1950s (cf. Giertz [1991, pp. 271-273]).

It is not obvious that Swedish producers of consumption goods did benefit, as the raw material producers, from the 1949 devaluation. It led to a decline in real wages *paribus* hampering demand for consumer durables. Besides, the export share of total sales was lower and the import share of total inputs higher for engineering companies than for raw material producers. But the undervalued SEK led to significant (net export) demand multipliers and to competitive advantages of Swedish companies in

<sup>71</sup> The SEK was evaluated by 30 per cent in relation to the U.S dollar, following a devaluation of the pound sterling. (A 17 per cent revaluation of the SEK had been made in 1946.) As other countries followed the British example, the SEK was devaluated in practice with 13-15 per cent.

<sup>72</sup> Similar import restrictions in other countries postponed the export of Swedish cars, particularly to other Nordic countries.

engineering, particularly in relation to American producers. The devaluation did also lessen the external restrictions on Swedish monetary and fiscal policies in the 1950s, a clear advantage especially for the consumer-good industries.

As already mentioned, the interest rates were permanently low, at least until the mid 1950s, thus, monetary policies were passive from a stabilization viewpoint.<sup>73</sup> The real rate of interest shrank steadily in the 1950s until the economic upswing at the end of the decade. Attempts were really made until the recession in the late 1950s to restrict credits by agreements between the Central Bank and commercial banks and the use of new rationing instruments (see below). However, monetary policies did only become restrictive during some years in the mid 1950s (Bergström [1969, pp. 117-123] and Jonung [1993, pp. 295-300]). Besides, the leading companies/industries were probably less hit by capital rationing (cf. 7.4.1).

From the end of the war to the late 1950s, Swedish fiscal policy may be dubbed Keynesian. It was clearly counter-cyclical and expansive in general (Matthiessen, [1971, p. 176]). As a consequence of fiscal and welfare policies, demand for consumer durables was stabilized on a high level. Besides, a rise in investments' share of public expenditures until the mid 1950s was beneficial for companies such as ASEA, Scania-Vabis, Volvo and Atlas Copco.<sup>74</sup>

Fiscal attempts were made until the late 1950s to restrict private investment by fees, investment taxes, higher statutory corporate taxes, stricter rules of inventory valuation and a phasing out of the use of free depreciation allowances for machinery and equipment (Bergström [1969, pp. 66-67] and Södersten & Lindberg [1983, p. 41]). However, the total tax burden on companies was stable until 1958.<sup>75</sup> In addition, tax restraints were counter-balanced by huge deposits in investment funds from the mid 1950s which were particularly beneficial for large and capital-intensive companies (see next section). Furthermore, the measures to curb private investments were offset by expansive fiscal (and welfare) policies leading to demand-induced investments, particularly in consumer industries. Besides, labour-intensive producers of consumer durables were less hit by fiscal measures to restrict investments.

Profitability (both before and after taxes) and profit shares in Swedish manufacturing were generally high in the late 1940s and the 1950s at least in comparison to subsequent decades (Erixon [1987, p. 43] and [1991, p. 282]). There was only one "branch of crisis" - textile and garment industry. Profits were high in spite of a growing labour shortage. They reflected favourable demand conditions and a vigour of leading industries independent of "policies" but also an undervalued SEK, expansive fiscal and

<sup>73</sup> Jonung [1993, pp. 295-298]. A Keynesian label on Swedish monetary policies in the early Golden Age is justified by Keynes' recommendation in *the General Theory* that the rate of interest should be kept low over the business cycle.

<sup>74</sup> Figures on total public investments and total public expenditures 1950-1973 have been brought from Statistics Sweden [1990, table 11.7].

<sup>75</sup> See figures on effective tax rates (taxes actually paid as a ratio of operating surplus less capital consumption) in manufacturing and on companies' share of total taxes in Sweden, Erixon [1987, pp. 42-43] and Bergström [1969, p. 116].

monetary measures and trade regulations. For instance, a fragile Swedish car industry was first protected by import restrictions. The similarities between the 1930s and the early Golden Age are striking.

It seems that economic policy (broadly defined) in the early Golden Age was particularly advantageous for the industries of the Swedish model. For instance, they were supported by profit taxes, at least from the mid 1950s. As economic policies contributed to high profits in the leading industrial sector, they were also conducive to the sector's further expansion. The leading companies' ability to build up internal risk capital and attract equity capital was raised. The discriminatory effects of these policies are discussed in section 7.4.1.

### 6.2.2 *The Late Golden Age*

Swedish fiscal policies were still predominantly expansive (mainly as a reflection of public sector growth) from the end of the 1950s. In addition, fiscal policies had counter-cyclical effects, at least until the mid 1960s (Matthiesen [1971, p. 176] and Lindbeck [1975, p. 104]). This was also true for monetary policies which now became instruments of Swedish stabilization policies (Jonung [1993, pp. 298-303 and 346-348]). Beside discount policy, a broad range of credit regulating devices were used to offset business cycle fluctuations such as interest rate penalties, rules for commercial banks' liquidity and cash accounts and ceilings for commercial lending. Larger variations in the real rate of interest from the mid 1950s reflected (although not wholly) a more counter-cyclical monetary policy<sup>76</sup>.

At first glance it seems, that Swedish economic policies in the late Golden Age were less advantageous for the leading business sector. Pre-tax profitability and profit shares fell in most branches of manufacturing in the 1960s and early 1970s. In fact, Sweden experienced, together with Great Britain and the Netherlands, a stronger decline in profit shares in manufacturing than other OECD countries (Erixon [1987, p. 53] and Erixon, [1994, p. 38]). Moreover, the Swedish decline in pre-tax profit shares was worse for larger than for smaller firms (Södersten [1971, p. 323] and Sveriges Verkstadsförening ([1980, pp. 31-34]).

The tendency of a profitability decline in Swedish manufacturing could have been abolished, at least temporary, by a devaluation exactly as in Denmark, Finland and Great Britain (1967). A devaluation would also have reduced the current-account deficits emerging during the peaks of the mid 1960s and the late 1960s. But deficits in the current account, and also in the capital account, were met by restrictive monetary and fiscal policies, not by a devaluation. Credit restraints were also used to prevent inflation in the economic upswing 1969-1970. As a result, monetary policies became more restrictive than ever before in the postwar period with a possible exception of the mid 1950s.

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<sup>76</sup> The enlarged use of monetary instruments in stabilization policies in the 1950s was no unique Swedish feature. The same development can be distinguished, for instance, in other Nordic countries.

Furthermore, counter-cyclical fiscal measures were applied too late in the peaks 1964-1965 and 1969-1970. As a consequence, fiscal restraints hit the Swedish economy at full strength in the following recessions. Moreover, restrictive fiscal (and monetary) policies were needed during the first part of the recessions to eliminate current-account deficits.

Thus, partly through bad timing, partly through a reluctance to devaluations, monetary and fiscal policies became restrictive during or immediately before the recessions in the mid 1960s (close to neutral in the fiscal case) and the early 1970s. In general, stabilization policies became more restrictive from the mid 1960s. Besides, as far as fiscal policies are concerned, investments' share of public expenditures decreased sharply in the mid 1960s. This was inauspicious for the large Swedish producers of investment goods.

But the conditions for accumulation in the leading industrial sector in the late Golden Age were not bad after all. Among industries in Swedish manufacturing, saw mills and pulp industries only were hit by *sharp* decline in pre-tax profitability until 1973. (The iron and steel industries must be added to the group if *profit margins* are accounted for.) Besides, the profitability decline *in* wood companies seems to have been modest (Rydeman [1980, p. 132]).

Producers of transport equipment except shipbuilding - a branch dominated by Saab(-Scania) and Volvo - did not experience any decline in pre-tax profitability (or profit shares) at all. Swedish companies in engineering, particularly in transport equipment industry, were helped by a German revaluation in 1969. Moreover, they still benefited from the fact that investments' share of public expenditures had increased from the mid 1950s to the mid 1960s. Improvements in Swedish high-way systems led to a strong increase in domestic demand for heavy trucks (Giertz [1991, pp. 283-284]).

In addition, *the profit tax system* effectively mitigated the fall in profitability of the leading industrial sector. The decline in profitability in Swedish manufacturing as a whole 1953-1972 *is halved* if profit taxes are accounted for (Erixon [1987, pp. 38-39]).<sup>77</sup> The reduction in effective profit taxes was primarily due to depreciation allowances (at high investments) and the investment funds.<sup>78</sup>

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<sup>77</sup> The effective tax rate in Swedish manufacturing was significantly higher in the 1950s than in the 1960s and the early 1970s. However, the sharpest decline occurred in the second half of the 1950s Erixon ([1987, pp. 42-43]).

<sup>78</sup> A reduction in statutory corporate tax rates in 1960 was of less importance (Södersten [1971, pp. 226-332]). International comparisons of the late Golden Age do not unambiguously show that profit taxes actually paid were lower in Sweden than in other OECD countries. In 1960, corporate taxes as a percentage of GDP was the same in Sweden (2, 4 per cent) as in the present EU countries on average but much lower than in the OECD on average (3, 8 per cent), see Hoellert *al* [1996, table 9]. Furthermore, it seems as if the Swedish case of a milder profitability decline *after* taxes has correspondences in other countries (Erixon [1987, p. 52]). A conclusion that Swedish corporate taxes were not lower than in other OECD countries in the late Golden Age is confirmed by a comparative study of effective *marginal* taxes in 1980 in Sweden, Great Britain, West-Germany and the U.S (Södersten & Lindberg [1983, pp. 30-32]).

The use of investment funds since the mid 1950s to reduce business cycle fluctuations was a typical Swedish innovation. Swedish firms were already through the profit tax reform in 1938 allowed to make deposit deductions from their profits in particular funds for investments. Deductions up to 40 per cent were permitted in the Golden Age. From the mid 1950s, the main condition for allowances was that a certain share of the deduction (almost half of the deduction in the Golden Age) must be placed in interest-free accounts in the Central Bank. These reserves could be regained depending on a permission by the Central Bank following an assessment in the light of the goals of stabilization policy (Södersten & Lindberg [1983, pp. 53-56]).

The investment funds had a strong positive effect on the consolidation of large companies and capital-intensive industries (Södersten [1971, pp. 324-325 and 329]). Tax allowances for large companies in engineering raised financial funds not only for internal expansion but also for take-overs.<sup>79</sup>

The leading industrial sector was not hit by restrictive monetary policies in the late 1960s and early 1970s. Increases in the rate of interest did not lead to strong increases in the sector's capital costs because of tax deductions. In addition, export companies were excepted from monetary restraints *inter alia* through permissions to borrow abroad. The old outward companies had the largest opportunities to take foreign loans on favourable terms. Moreover, industrial companies circumvented monetary restrictions by borrowing on "grey" credit markets in Sweden and by extensive self financing.

To sum up, because of accumulated savings, tax allowances and favourable foreign loans, investments by the large outward companies were not seriously restrained by monetary policies in the late 1960s and early 1970s. In Swedish manufacturing, medium-sized firms only were gravely hit by deflationary monetary policies.<sup>80</sup>

The large companies in engineering benefited in the late Golden Age not only from tax allowances and macroeconomic policies but also from active labour market policies. Selective job creation programmes and measures to improve matching and affect labour supply were consistently implemented during the 1957-1958 recession and gained substantial importance in the mid 1960s.<sup>81</sup> At the end of the Golden Age,

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<sup>79</sup> In 1960 and in 1970, the statutory corporate tax rate in Sweden were 49 and 53 percent and the *effective* corporate tax rate at investment funds 37 and 41 percent respectively (Södersten & Lindberg [1983, pp. 53-56]).

<sup>80</sup> Matthiessen [1971, pp. 211-213], Kragh [1973, pp.156-158], Bergström [1981, p. 3], Södersten & Lindberg [1983, pp. 30-32] and Wihlborg [1993, pp. 266-267 and 254].

<sup>81</sup> Two trade union (LO) economists, Gösta Rehn and Rudolf Meidner criticized the stop-go Keynesian policy of the 1940s and the early 1950s. In a report to the LO congress in 1951, they suggested a programme for obtaining full employment without inflation. Contractive economic policy (primarily fiscal policies) should control inflation by squeezing profit margins. Full employment was to be obtained by labour market programmes (training, subsidies for occupational and geographical mobility, regional policies and labour market information). They assumed that such measures were less inflationary than expansive fiscal and monetary policies.

expenditures on active labour market policies were higher in Sweden than in other OECD countries (Erixon [1984, pp. 10-11]) and SOU 1993:43 [1993, p. 125]. Supply-orientated measures to stimulate occupational and regional mobility expanded most from the late 1950s to the early 1970s (Johannesson [1981]). The supply measures benefited large engineering companies which faced a growing labour shortage and were mainly located in the southern regions of Sweden which experienced a large net immigration in the 1960s (cf. Nilsson [1995, pp. 19-22]).

Standardized producers of consumer goods benefited from welfare reforms in the late Golden Age. Real investment in housing increased steadily from the early 1950s to the mid 1960s to culminate during the time of the Million Programme. The incremental pension funds (the ATP) were the most important financiers of the programme in terms of bond holdings (Englund [1993, pp. 161 and 190-191]).

Swedish consumer-good industries benefited also from redistribution policies. Narrowed wage and income differentials after taxes in the 1960s speeded up the use of durable consumption-goods. Redistribution policy partly explains why private passenger cars from Volvo and Saab became common properties of Swedish families in the late Golden Age.

Trade union policies from the late 1950s were clearly in line with the interests of the leading industrial sector. Solidaristic wage policy (including policies to level out wage differentials in general from the mid 1960s) did not seriously hit the leading industries with the exception of small (labour intensive) saw mills. The strength of the LO in the 1960s did not challenge the wage leading role of the large export companies.

Solidaristic wage policy stimulated demand for products of large engineering companies. It did also stimulate, as employment policies, their product development. The incitements to use capital-intensive techniques in Swedish manufacturing were raised due to higher costs of unqualified work. For instance, the use of industrial robots in Swedish engineering increased in the 1960s. As a consequence, strong incitements arose in manufacturing to supply other industries with labour saving equipment (Schön [1990, p. 82]). ASEA became the largest domestic supplier and also a world leading producer of industrial robots in the 1970s.

My view of Swedish wage formation excludes the possibility that the leading sector was restricted by wage policies in the Golden Age but also, that they gained by “wage moderation” as a result of solidaristic wage policy<sup>82</sup> or commitments by the LO to preserve Swedish competitiveness. The large export companies were wage-leaders. It is true that solidaristic wage policy hit the leading companies indirectly by leading to higher input prices. But *positive* indirect effects of solidaristic wage policy must be considered as well. The policy speeded up the demand for consumer durables in lower income brackets and for labour-saving techniques. Such demands were exploited by large companies in engineering<sup>83</sup>.

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<sup>82</sup> According to the theory of solidaristic wage policy, profitable firms are favoured since they are able to pay higher wages than the solidaristic ones.

<sup>83</sup> The importance of solidaristic wage policy for structural change in Sweden shall not be exaggerated. According to a comparative Nordic study, wage equalization was not decisive for the

### 6.2.3 “What’s Good for Volvo is Good Also for Sweden”

The interests of Swedish wage-earners in the Golden Age did not seem to collude with the expansion of the leading companies. The companies’ support of the Swedish model was shown by friendly statements about solidaristic wage and labour market policies but also in practice.

Large foreign investments by Swedish companies were not an indication of capital flight in spite of profit-squeeze tendencies in Sweden. Foreign production ~~decreased~~ increased in relation to total foreign sales for the group of leading engineering companies 1966-1973 - see [table 11](#). In fact, for one of the most outward companies, Electrolux, the foreign-units’ share of foreign sales decreased sharply from the early 1960s through take-overs of Swedish firms and closures (or sales) of foreign plants.

In general, export and foreign production by large engineering firms were complements rather than substitutes in the late Golden Age - “closeness” was necessary to satisfy foreign demand. In particular, export from EFTA countries to EU countries was prevented by trade barriers. In addition, foreign production by the large companies resulted in export from their Swedish units.

The advantages of being close to foreign markets did not exclude a rivalry when Swedish companies made decisions whether to produce in Sweden or abroad. But here, transportation costs rather than wage costs were decisive. In fact, Swedish companies expanded most in countries with high wages and incomes (SOU 1982:27 [1982, chapter 6 and 7]). Tendencies of labour scarcity in Sweden, hastened by full employment policies, did not induce leading companies to go abroad.

It is true that foreign production increased significantly in relation to exports for earlier home-market companies such as ASEA and Volvo in the 1960s and early 1970s. Moreover, an increase in the leading engineering companies’ employment abroad in relation to their total employment - see [table 12](#) - mainly reflected developments in Volvo and ASEA (and Ericsson). But foreign units’ share of foreign sales and total employment for ASEA and Volvo was still small in 1973, 38 and 18 per cent respectively for ASEA and 29 and 17 per cent respectively for Volvo.

In addition, head offices and R&D departments in the Swedish transnational companies were still located in Sweden at the end of the Golden Age. A small increase in foreign units’ share of R&D expenditures in the late Golden Age for the companies together reflected *one* company’s, namely SKFs, establishment of a research centre in the Netherlands in 1972 (SOU 1982:27 [1982, pp. 126-129]) A larger move of strategic activities from Sweden would have been both an indication and a source of a growing conflict in the Swedish model.

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elimination of plants and the production growth in textile and garment, and wood-product sectors in the 1960s and the first half of the 1970s (Erixon [1984, pp. 27-37]).

Employment in Swedish manufacturing decreased both in absolute and relative terms from the mid 1960s. The decrease primarily reflected a strong productivity growth in manufacturing and a demand shift from goods to services, not that manufacturing was “crowded out” by the public sector (for instance, by its financing) or that Sweden had lost competitiveness due to labour priorities. The loss of market shares for pulp industries were due to factors which hardly could be blamed on the hegemony of labour (cf. chapter 7). Besides, the Swedish reduction in the manufactural share of GDP in the late Golden Age was not dramatic - see [table 4](#).

However, my interpretation of the Swedish model assumes not only an absence of strong internal conflicts. It also assumes that capital and labour benefit from each other. The mutual interests in the Swedish model shall not hide, however, that raw material industries and large engineering companies were more important for the Social Democratic project than the other way round in the Golden Age.

The prime comparative advantages of Sweden for the leading industrial sector was her resource endowments and the skills and knowledges that had been accumulated in the country over a long period on the basis of natural resources and pathbreaking innovations. Moreover, the attachment of leading managers and owners to Sweden was probably more based on national affinity than on policy measures.<sup>84</sup> It seems also that the leading industries were more effective in satisfying labour priorities than the policy model itself in the Golden Age.

The small fluctuations in Swedish GDP in the Golden Age (see table 1) reflected a stable export growth rather than a successful stabilization policy. In most OECD countries, including Finland, Iceland and Norway, the variations in export exceeded the variations in the GDP 1953-1973. This indicates (although roughly), that economic policies, together with built-in-stabilisers, evened out business-cycle fluctuations in many OECD countries. In Sweden, the variations in export and GDP were low and of equal size. Thus, it was easier for economic-policy makers in Sweden to even out business-cycle fluctuations but their contribution to stabilization was more limited than in other countries.<sup>85</sup>

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<sup>84</sup> I ignore in this paper the importance of educational and public R & D arrangements for the success of the Swedish model in the Golden Age. Here, much research remains to be done.

<sup>85</sup> Swedish stabilization policies in the Golden Age have traditionally been considered as a success story, at least until the mid 1960s. However, above, I have emphasized the importance of favourable external conditions for the stability in Swedish GDP rather than that of economic policies. The swings in Swedish GDP ought to have been lower than the variations in export as there are strong built-in-stabilisers from import of inputs to Sweden’s differentiated industry and from a rapid public sector growth in the late Golden Age. However, the relatively good balance between inflation and unemployment in Sweden in the early 1970s was primarily due to economic policy. A lower rate of unemployment than in other OECD countries was obtained by labour market policies, not by Keynesian counter-cyclical policies. The policy mix, however, was more the result of bad timing than a of conscious application of a typical Swedish strategy (cf. The Rehn-Meidner model). Attempts to dampen the previous business -cycle peak came (as in the mid 1960s) too late.

## Charter 7- Black Clouds At The Horizon - Tensions In The Swedish Model

Above, I have given an idyllic picture of the Swedish model in the Golden Age. The state was able to keep up profitability in leading industries and firms which, in their turn, were able to generate high growth in Sweden. Above all, the Golden Age ends with a profit boom in the leading Swedish industries (1973-1974) primarily a reflection of high export prices on raw materials and strong investment demand in major OECD countries. The profit boom also reflected a reluctance of the government to reevaluate the SEK. But there are signs, even in the Golden Age, that the Swedish growth model had some shortcomings and costs.

Criticism of the Swedish model formed a “red wave” from the late 1960s. Labour protests against Taylorism and Fordism, fundamental principles of the model, showed up in strikes, high turn over, shirking and absenteeism. The protests were directly induced by rationalizations in leading sectors (including mining) but they reflected also an exceptionally strong position of labour in Sweden at the end of the Golden Age.

The “red” revolt against the Swedish model was not only spontaneous. The LO and its trade unions questioned the prerogative of leading companies to control strategic investments and their earnings of “excess profits” generated by the solidaristic wage policy. The LO offensive culminated after the profit boom with a radical proposal of wage-earner funds (1975-1976)<sup>86</sup>.

Wage-earner funds were unanimously resisted by the private business sector in Sweden. The resistance shaped the “blue wave” in Sweden, a palpable political movement in almost all Western countries in the 1980s.

Thus, the support of the Swedish model from both capital and labour did gradually vanish in the 1970s. Labour emphasized the limitations and negative welfare effects of the model while capital criticized the attempts to go beyond it and also to push welfare reforms too far. In addition, predecessors of a “green wave” from the mid 1970s disputed the fundamental priority of growth in the model. The model was accused of leading to environmental problems (such as dead forests) and regional imbalances.

My account of shortcomings and costs of the Swedish model will concentrate on its inability to generate sustainable growth, not on its effects on power relations, distribution, work content, regional balances or environment. First, a further expansion of leading industries in Sweden was restricted by some labour priorities. Second, leading companies and industries showed, independently of the priorities of the Swedish model, a weaker growth potential in the late Golden Age. Third, the dominance and strategies of the large companies in engineering had some negative effects, although not yet obvious, on Swedish growth, Their foreign orientation and

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<sup>86</sup> I will not consider the Job Security Act (1974) or the Co-Determination Act (1977) as breaks with the Swedish model. These laws were rather confirmations than challenges of developments in leading companies.

specialization was not unambiguously beneficial for Sweden and the working of the Swedish growth engine prevented the emergence of new growth engines.

### 7.1 Internal Conflicts in the Model

The tendencies of a decline in pre-tax profitability in the leading industries in the Golden Age were caused by a combination of increasing labour shortage, harder international competition and lower demand growth. Economic policies contributed to labour scarcity since macroeconomic policies were expansive or substituted by labour market policies, particularly in the recession of the early 1970s.

Labour shortage led to massive immigration of low skill workers most of them from Finland. Immigration to Sweden culminated in the economic peaks 1964-1965 and 1969-1970. The number of immigrants was, however, not large enough to offset the tendencies of labour shortage and profitability decline in Swedish engineering (with the exception of transport industries less ship building).

According to the French regulation school, labour shortage was not the decisive factor behind the profitability decline in the Golden Age (Lipietz [1988] and Boyer [1988]). The school claims that productivity growth was hampered by workers' revolt against Taylorism and Fordism.<sup>87</sup> However, in my view, impoverishing work conditions, related to large-scale production, resulted in growing difficulties to recruit labour for leading industries, not to serious obstacles to productivity growth in Swedish manufacturing. On the contrary, productivity was stimulated by labour scarcity leading to rationalizations and the expansion of industries producing labour-saving techniques.

To summarize, "labour strength" in the Golden Age is important in both the French regulation theory and my theory of the profitability decline in Swedish manufacturing. The difference is that strong labour impeded productivity growth in the French theory while it resulted in high wage claims and reluctances to industrial work in my theory.

The Swedish model was threatened not only by a growing conflict between full employment policies and capital accumulation but also, quite independently, by growing difficulties of the leading industrial sector to generate high growth in Sweden.

### 7.2 An Exhaustion of Growth Potentials of the Swedish Model

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<sup>87</sup> Robert Boyer [1987] adds that productivity potentials were exhausted in the late Golden Age. In the Swedish case, this argument is valid for raw material industries, at least in the medium term. An exhaustion of productivity potentials explains to a large extent why productivity growth was higher in the 1960s than in the 1970s in Swedish raw material industries.

There were three threats against a further growth of the leading companies and industries (where markets and technology are concerned) at the end of the Golden Age.

- A saturation of demand for main products.
- Low-cost competition *inter alia* from larger foreign firms and underdeveloped countries.
- Large productivity potentials were, especially in raw material industries, exhausted or, by technological reasons, more difficult to create.

The first two threats are characteristic for “mature” companies particularly if they come from small countries. They were also threats to Sweden because of the companies’ dominant position. At the end of the Golden Age, Swedish manufacturing could expect a lower demand growth and a fiercer foreign competition relying on either scale advantages, low wages or low (other) input prices. In addition, it had become easier for underdeveloped countries in the Golden Age to catch-up Western technologies. Knowledge was rapidly spread through trade liberalizations and transnational companies. Thus, it was more difficult for Swedish industry to counter-balance high nominal costs with productivity advantages.

The raw material industries’ share of Swedish export was sharply reduced in the Golden Age (see table 7). Moreover, the transformation of Swedish export from unfinished to finished goods was rapid in an international perspective. But, as already mentioned, the raw material industries’ shares of employment and production in Swedish manufacturing were surprisingly stable in the Golden Age. Sweden was still specialized in wood industries in the mid 1970s although to a somewhat lesser degree than at the end of World War II.<sup>88</sup> Swedish producers were vulnerable since the transformation from pulp to paper products had been more extensive in competing countries. Moreover, Swedish pulp producers suffered from high raw material costs in comparison to its North American competitors (Carlsson *et al* [1979, pp. 95-96]).

Sweden’s specialization in iron and steel products did actually increase in the Golden Age, thus, in a period when Japan and NIC countries invaded Western markets. External threats to Swedish iron and steel industries were not warded off by up-gradings. Sweden lost world market shares for special-steel products at the end of the Golden Age when earlier quality advantages were captured (LU 80 [1981, pp. 146-178]).

The Swedish change in export composition from semi-finished to finished goods in the Golden Age was not exceptional compared to *other raw material* (or agricultural)

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<sup>88</sup> In fact, Sweden *increased* her market share for wood products (primarily for saw mills) in the 1960s and early 1970s in spite of a relatively low world demand (Erixon [1988, pp. 14] and Mjøset *et al* [1997]).

countries. In fact, there was a clear convergence between OECD countries. Export transformation was fastest in countries with the highest share of unfinished goods in the initial state.<sup>89</sup>

Sweden did become more specialized in engineering and also in R & D-intensive branches in the Golden Age. However, the threats of low demand and harder competition did also exist in Swedish engineering. Engineering industry ~~was~~ specialized in technologically sophisticated products at the end of the Golden Age (Ohlsson [1976] and Carlsson *et al* [1979, pp. 78-81]). In fact, Ericsson, Saab-Scania and ASEA were the only large “high-tech” companies according to conventional classifications.<sup>90</sup>

The threats to established companies and industries from low market growth and “primitive” cost competition did not show up on the macroeconomic level in the Golden Age. However, Swedish growth was kept up (and market shares regained) by *some* leading companies and ~~by~~ *reconstructions* of established industries through rationalizations (including mergers) and mechanization, not by structural change. Neither case offered promising prospects of *sustainable* Swedish growth.

There was only one industry which gave a significant contribution to the preservation of Swedish market shares from the mid 1960s - car industry. Besides, the contribution was primarily a reflection of high market growth for cars, not of higher market shares for Swedish car producers (Mjøset *et al* [1997]). The competitive pressure on Swedish car industry was raised at the end of the Golden Age through Japanese invasions of Western markets and mergers (or take-overs) by European companies. To match scale advantages of foreign companies, the manager director of Volvo (P-G Gyllenhammar) and the Wallenberg family tried to merge Saab-Scania and Volvo in 1977. As they failed, the Swedish car companies began to penetrate more exclusive market segments.

The potential for productivity increases in Swedish manufacturing was large in the late Golden Age. It was largely exhausted in raw material industries by rationalizations. Such reconstructions led to a one-time lift in productivity only, not to a stable productivity growth. Industries in Swedish manufacturing with the highest productivity growth 1965-1974 were, in fact, hit by the strongest decline in the latter half of the 1970s and the 1980s (Erixon [1990, pp. 73-76]). Significant production slacks in Swedish raw material industries were not built up again until the late 1980s. Beside, mechanization and a maturity of technologies had made it more difficult, even in the Golden Age, to create large productivity potentials by the use of new technologies.

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<sup>89</sup> Horwitz [1979, p. 43] and Erixon [1984, pp. 25-26].

<sup>90</sup> Some steps were taken in the late 1960s to break the tradition of a passive growth policy. A government department for industry and an investment bank was established. State-owned firms were organized in a particular industrial group. Finally, a public institution for R&D support to companies and inventors (STU) was formed. Still, industrial policies played a minor role in the reconstructing of Swedish manufacturing in the Golden Age. But there are exceptions. R&D supports encouraged, together with public health investment, the expansion of Swedish pharmaceutical and medical-technical industries during the second half of the 1960s, see, for instance, the foundation of Pharmacia Biotech.

### 7.3 The Social Price of Outwardness and Specialization

Hitherto, the existence of outward specialized companies has been seen as a comparative advantage of Sweden. The companies have even been considered as main actors in a dynamic innovation system. But their enlarged foreign orientation and specialization in the Golden Age had some negative effects on Swedish growth although less apparent in the short run.

The Swedish innovation system might have been impaired by the “core” strategy of the large engineering companies in the 1960s. Although successful for the companies under discussion, at least in the short run, their avoidance of risky investments in new fields probably reduced the possibilities of Swedish industry to penetrate new product markets and also to develop or adapt new technologies<sup>91</sup>. The core strategy led conceivably to a worsen growth trajectory for Sweden.

Furthermore, the development of Swedish suppliers in the Golden Age might have been restricted by large companies’ export and foreign production. The up-grading of domestic suppliers was often neglected by the outward leading companies. Their foreign investments were partly both a reflection and a cause of a weaker attention to domestic suppliers. The large engineering companies’ unwillingness to take a larger responsibility for product developments in supplying Swedish firms was serious since many suppliers were strongly depending on their orders. The leading companies could have speeded up the use and development of new technologies in small and medium-sized Swedish firms and also the concentration of supplying industries.

The foreign orientation of leading companies is one explanation of why Swedish suppliers, particularly in car industry, did not obtain a high technological level in the Golden Age (cf. Fölster [1991, pp. 216-217]). Furthermore, the large number of bankruptcies of small firms and the dramatic reduction of employment in Swedish manufacturing in the early 1990s is partly explained by the vulnerable position of suppliers in Swedish engineering (primarily in car industry).

In addition, foreign investments by large Swedish companies could have laid the ground for a rivalry between Swedish and foreign units and a shift in the companies’ centre of gravity to other countries. It is true that the sharp increase in the companies’ foreign production in the Golden Age was corresponded by high export growth. Besides, it did not lead to an unfavourable specialization pattern for Sweden. But the mere existence of operating units abroad (whatever the initial reason) opened the possibility, that production could be moved from one country to another within a relatively short time. Thus, the expansion of Swedish companies abroad might have

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<sup>91</sup> A “diversification wave”, similar to the American one in the 1950s and the 1960s, started in Swedish engineering industry at the end of the Golden Age. Now, the large Swedish companies wished to avoid a strong dependency on core products. The real starting-shot was Volvo’s buy of the sport company Jofa and Electrolux’ requirement of Facit, a producer of calculators, in 1973. However, the leading companies then went “back to basics” in the 1980s and 1990s. They abandoned products with weak technological links to the core assortment.

founded a rivalry between export and foreign production, particularly where sales to *third countries* are concerned.<sup>92</sup>

The greater possibilities of leading companies to reallocate production between countries made managers more inclined in the 1970s to base their production and employment decisions on temporary cost differentials between countries. As a consequence, it became more tempting for politicians in Sweden to use measures in stabilization policies to improve Swedish competitiveness.

Furthermore, the large Swedish companies' possession of production units near their large markets in Western Europe and the U.S raised the probability that R & D and other over-head resources were moved from Sweden after the Golden Age. For instance, it became more and more important for the large Swedish companies in engineering in the 1970s and the 1980s to design products in close contact with their foreign customers. The gradual move of R & D activities from Sweden was probably a blow to the Swedish national innovation system as it prevented up-gradings of Swedish units and reduced the amount of technological spill-over effects produced or assimilated by the leading companies.

#### 7.4 Locking-In Effects

The concept "locking-in effects" is crucial in my discussion of a conflict between the expansion of the leading industrial sector and other business activities in Sweden. I will use the concept for either of the following cases:

- \* The leading companies and industries get resources for a further expansion through their ties to public authorities and major capital interests or by the simple reason that they have been profitable or solid in the past, not necessarily because of promising market prospects.
- \*\* The expansion of the leading companies and industries hampers the development of new growth engines *per se*.

The second definition of locking-in effects is similar to the one of private crowding out. The section "new growth engines" has been added to avoid a rather trivial statement that the expansion of established firms takes resources away from other firms when production factors are scarce. My account of "locking-in effects" will cover the case where the development of dynamic firms and industries (with good profit prospects in the long run) is prevented by the expansion of established firms and

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<sup>92</sup> Figures for 1974 and 1978 do not show any increase in third-country sales for an aggregate of Swedish companies dominated by the leading engineering companies. However, third-country sales increased to West-Germany because of Volvo's acquirement of DAF in the Netherlands in 1972 (SOU 1982:27 [1982, pp. 240-252]).

industries. Thus, I will assume that the expansion of the leading sector has distorting effects on industrial structure.

My notion of “locking in” is firm-specific (or industry-specific), not technology-specific. In industrial economics, the concept is often used to cover the cases of path-dependent technologies. I will not exclude, that an industrial process is characterized by locking-in effects in both respects. However, it cannot be taken for granted that established firms use technologies with low capabilities or limited spill-over effects. Analogously, it is not certain that a specialization of leading companies on “mature” products or technologies, as in the Swedish case, excludes the developments of dynamic industries and firms. I will discuss below whether dynamic industries and firms in Sweden were crowded out by the leading industrial sector.

#### 7.4.1 *The Early Golden Age*

At first sight, it seems that renewal occurred in the Swedish business sector at least until the mid 1960s. (In this chapter, the early Golden Age ends in the mid 1960s and not in the late 1950s as in chapter 6.) A large number of new firms were established in manufacturing in the late 1940s. Moreover, the number of new establishments increased (also in relation to the total number of firms) from the early 1950s to the mid 1960s.

But product innovations were neither a driving force behind (as, in fact, in the 1930s), nor a by-product of new establishments in Swedish manufacturing in the early Golden Age. Entrepreneurship was stimulated by market growth, not the other way round, and market growth was determined independently of innovations.<sup>94</sup> Formally independent new firms were not prime exponents of new ideas in the early Golden Age (see the Swedish innovation system). A substantial share of new firms in manufacturing were subcontractors to leading companies rather than independent actors on world markets.

The growth potential of new firms in the early Golden Age seems to be limited. New firms' contribution to employment in Sweden was almost twice as large in the interwar period as in the 1950s and the 1960s.<sup>95</sup>

High aggregate growth shall not hide that the Swedish model inhibited the development of new growth engines. The devaluation in 1949, and the absence of a

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<sup>93</sup> Du Rietz [1980, pp. 21-22] and [1985, pp. 174-175 and 182] and Jagrén [1992, pp. 14-15]. However, the new firms' share of total employment (in the year of entry) was stable from the early 1950s to the mid 1960s.

<sup>94</sup> The conclusions above are based on a cross-sectional study of new establishments 1954-1968 in plastic and engineering industries (accounting for approximately 45 per cent of employment in Swedish manufacturing). Simultaneity problems might, however, have underestimated the influence of new firms on growth (Du Rietz [1980, pp. 56, 79-81, 118-123, 160 and 166]).

<sup>95</sup> The shares were clearly below 1 percent in the early Golden Age (Du Rietz [1985, pp. 179-185]). New firms seem to have been more important for employment in manufacturing in the U.S than in Sweden (Du Rietz [1980, p. 63] and [1985, pp. 183-184]).

reevaluation during the Korean War, led to “locking-in effects” in Swedish manufacturing (cf. Jörberg [1984, pp. 42-44]). The profit boom raised internal funds for investments, and therefore the supply of low-cost capital, in established export industries, particularly in wood industries. High profits did also raise their share prices thus crowding out new ventures from the stock market. Moreover, new and small firms could not significantly lift up their profit margins after the 1949 devaluation since they were seldom foreign orientated or exposed to foreign competition.

In addition, small and new firms were probably crowded out from loan markets in the 1950s. They benefited from low rates of interest in the early Golden Age but it seems, that credit rationing disproportionately favoured established firms and sheltered sectors such as construction. Locking-in was reinforced by the profit tax system which favoured ploughing back of profits. The “double taxation” of profits in Sweden, thus taxes on both companies and share holders, made the financing of investment by retained earnings much cheaper than by new share issues.<sup>96</sup> Furthermore, the profit tax system led to locking-in effects by favouring established and capital-intensive firms. It is true that they were disfavoured by revisions of the profit tax system in the late 1940s and the early 1950s. But the large and capital-intensive companies benefited clearly from investment funds from the mid 1950s.

Sweden’s productivity growth in manufacturing and her export performance was not impressive at all in the 1950s compared to other OECD countries and adjacent decades.<sup>97</sup> In addition, GDP growth was relatively low in Sweden in the 1950s.<sup>98</sup> A weak transformation pressure on established companies, indicated by high average profits in manufacturing, is one explanation of the poor Swedish performance. But the size of the raw material sector was probably a growth-dampening factor taking both the nature of world demand and the emergence of locking-in effects into account. Raw material producing countries such as Sweden, Norway, Finland and Canada showed a weak overall export performance until the late 1950s.

Locking-in effects in Sweden in the early Golden Age might even have hampered growth in the long run. Few Swedish companies born after World War II have grown to large independent companies.<sup>99</sup> *Tetra Pak* is one of the few examples. The company got a leading position in inpackaging industry thanks to a Swedish innovation in the

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<sup>96</sup> Södersten & Lindberg [1983, pp. 25]. The tax discrimination of new share issues still existed in spite of a mitigation of double taxation in the early 1960s through the so called Annell legislation. It must be noted, however, that a similar tax favour of retained earnings existed in the U.S. in the Golden Age.

<sup>97</sup> See figures on export growth in [table 2](#). Growth in output per employed person in Swedish manufacturing was lower in the 1950s than in any other decades of the 20 century if the 1900s, the 1970s and the 1980s are ignored, Erixon [1991, pp. 245]. Unfortunately, cross-country data on productivity growth in manufacturing are not available for the 1950s.

<sup>98</sup> See [table 3](#). It is true that Swedish GDP growth was relatively low in the late Golden Age as well. But here, the figures for Sweden are weighed down by a rapid expansion of the (public) service sector. (The manufactural share of GDP was stable in the 1950s.)

<sup>99</sup> In fact, this is true also for the 1920s and the 1930s.

1940s. *Gambro*, a medical-technical company formed in the 1960s, is another example. None of the companies, however, is today among the 15 largest Swedish manufacturers where total sales or employment are concerned. Tetra Pak is close but only after the company's requirement of Alfa-Laval in 1991.<sup>100</sup>

Two pharmaceutical companies *Astra* and *Pharmacia*, expanded rapidly in the Golden Age but they did not reach a position as one of the 15 largest companies in manufacturing in the Golden Age.<sup>101</sup> Today, they are on the list of the 15 largest companies.<sup>102</sup> However, the size and technological spill-over effects of the Swedish pharmaceutical industry are too limited to justify a notion of growth engine.<sup>103</sup>

Locking-in effects in the early Golden Age might have impeded the expansion of new industries in general and the establishment of new firms in particular. New product areas were often penetrated by established companies.<sup>104</sup> Their penetration was not only an indication of locking-in effects. It also reflected a technical and commercial superiority by large firms as suggested by the Swedish innovation model. In any case, the growth path might have been more advantageous for Sweden if new industries such as the computer and pharmaceutical industries had been invaded by a multifold of firms and owners.

#### 7.4.2 *The Late Golden Age*

There are clearer indications from the mid 1960s of a weak renewal of the Swedish business sector. Production growth in Swedish manufacturing was relatively low until the first oil crisis in spite of a persisting success of the leading companies.<sup>105</sup>

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<sup>100</sup> In 1994, Tetra Pak was number 22 and 29 respectively on the list of the largest manufacturing companies in Sweden as far as total sales and employment are concerned (*Sweden's Largest Companies* [1995, pp. 1028 and 1032]).

<sup>101</sup> *Astra*, partly owned by the Wallenberg family, based its expansion on a mean for local anaesthetise developed in the late 1940s. *Pharmacia*, on the other hand, did not expand rapidly until the 1960s. The company was required by Volvo in 1985.

<sup>102</sup> In 1973, *Astra* was number 31 and 28 respectively on the list of the largest Swedish companies in manufacturing where total sales values and employment are concerned (*The 1000 Largest Companies in Sweden* [1974, pp. 108-109]). In 1994, *Astra* had climbed up to positions 9 and 14 respectively and *Pharmacia* to positions 11 and 11 respectively.

<sup>103</sup> It must be noticed, that the "new" companies above were founded before World War II. *Pharmacia* was established in 1911 and *Astra* in 1913. Tetra Pak was formally founded in 1950s but related to *Åkerlund & Rausing* (as *Gambro*), formed in the early 1930s.

<sup>104</sup> As already noted, jet engines for aircraft were developed by Volvo and ASEA. The latter company also became a producer of nuclear power and industrial robots. Furthermore, Saab entered the computer and space industry in the mid 1960s (*En bok om Saab-Scania* [1987, pp. 76-77]). But Saab sold its computer division (Datasaab) to Ericsson in 1981. Ericsson also required Facit in 1983.

<sup>105</sup> The large Swedish transnational companies significantly increased their shares of total export of industrial goods in the late Golden Age (Blomström & Lipsey [1988, pp. 108-11] and Jagrén [1992, pp. 12-13]).

Furthermore, the annual number of new firms decreased from the mid 1960s until the late 1970s both in manufacturing and in the business sector as a whole (Du Rietz [1985, pp. 174-175] and [1980, pp. 21-22]). It seems that the Swedish decline in entrepreneurship was exceptional, at least in comparison to large OECD countries.<sup>106</sup> At the end of the Golden Age, non-agricultural self-employment as a proportion of total civilian employment was lower in Sweden than in all other OECD countries (OECD [1992b, p. 158]).

Another indication of a weak industrial renewal in Sweden from the mid 1960s was that the country experienced losses of market shares due to product inflexibility. Sweden gained market shares for products with low demand growth but lost market shares for products with high demand growth. Swedish inflexibility emerged not only in manufacturing as a whole but also in engineering (Hultén [1988, pp. 188-195 and 220] and Mjøset *et al* [1997]).

The Swedish absence on dynamic world markets might have been a reflection of the large companies' core strategy rather than of the Swedish model as such. Furthermore, the low Swedish production growth (both in manufacturing and the whole economy) in the late Golden Age was to a large extent caused by labour scarcity which in its turn depended primarily on demographic factors, not on economic policy.<sup>107</sup> My hypothesis is, however, that the emergence and development of new industries and independent companies was hindered by the Swedish model.

Of course, the Swedish model cannot explain all of the decline in new establishments in the late Golden Age. The decline in Swedish manufacturing was partly caused by lower profitability and demand growth, tendencies which cannot entirely be related to the Swedish model. For instance, some of the lower demand growth for Swedish products reflected a shift in demand in favour of services. Besides, the priority ~~public~~ *public* services explains a lot of the low number of new establishments in Sweden. The expansion of the public sector in Sweden is partly explained by social attitudes and political arrangements not necessarily connected to the Swedish model.

I will insist on, however, that the Swedish model explains a substantial share of the decline in Swedish entrepreneurship in the late Golden Age. There are two possible theories. The first theory blames the decline on labour priorities such as rising income and wealth taxes, smaller income and wealth differentials ~~is~~ *inter alia* through solidaristic wage policy, and labour legislation.<sup>108</sup> The second theory says, on the other

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<sup>106</sup> Storey [1982, pp. 36-38], Du Rietz [1985, pp. 184-187] and Johnson [1986, pp. 53 and 63-65].

<sup>107</sup> The growth of the population from 15 to 64 years old in Sweden was lower 1965-1973 than in any of the 13 OECD countries Sweden is compared to in the statistical appendix, see OECD, Historical Statistics (periodicals).

<sup>108</sup> Du Rietz [1980, p. 83-86] and [1985, pp. 187-188], see also Davis & Henrekson [1995]. However, Du Rietz stress in his explanation of the decline in new establishments in Swedish manufacturing in the late Golden Age the influence of lower demand growth, higher financial entry barriers (caused by stronger scale advantages and mechanization), higher technical entry barriers (a stronger need of skilled labour) and concentration.

hand, that the Swedish *accumulation* model has prevented the establish and expansion of new firms. In this theory of locking-in effects, the “political” emphasize is laid on the discriminating role of profit taxes rather than on labour priorities.

The second theory about locking-in effects is probably more valid for Sweden than the first one in the late Golden Age. The decline in entrepreneurship happened to early to be fully explained by wage equalities, public sector growth or labour legislation. In addition, the relationship between labour priorities and entrepreneurship is ambiguous.<sup>109</sup>

The profit tax system made it difficult to develop new firms in the late Golden Age. Risk capital remained in large established companies. Besides, the financial consolidation of these companies made it easier for them to attract equity capital and credits. It facilitated also their take-over of small companies in engineering in the 1960s (cf. Rydén [1971, pp. 198-206]). In addition, low taxes on debts favoured large established firms in the late 1960s since other firms were hit by credit restrictions. But a theory that new establishments were prevented in the late Golden Age by locking-in effects cannot be reduced to a theory of biased corporate taxes.

First, the discriminatory role of monetary policies in the late 1960s has already been noticed. Monetary restraints hit other companies than the leading ones. Second, locking-in effects might have emerged in Sweden through the strong ownership links between the large companies and private banks. Indirectly, the large commercial banks were major owners of the leading companies. The Wallenberg family is the best example of a strong integration between large companies and capital markets in Sweden. Besides, other powerful industrial owners, who could have matched the Wallenberg family, did not appear in the Golden Age.

The concept “locking-in effects” is too narrow to cover all aspects of a negative relationship between the expansion of established companies and the formation of new vigorous firms in Sweden in the Golden Age. The lack of new Swedish growth engines is partly explained by the industrial structure *per se*.

The large-scale orientation of the leading industrial sector made it more and more difficult for small companies to develop in Swedish manufacturing. First, the leading (standardized) industries increased their share of total production in manufacturing in the Golden Age. Second, scale advantages became more important, at least in consumer-good industries, due to a standardization of consumer tastes, technological progress and a deregulation of trade. Third, fiercer international competition put a stronger pressure on Swedish companies to exploit scale advantages. The merger wave

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<sup>109</sup> It was assumed in an U.S study that entrepreneurs are *stimulated* by high marginal income taxes due to ease of underreporting income from self-employment compared to wage-salary earnings (Blau, 1987, pp. 448). In addition, solidaristic wage policy (and the priority of low-paid wage earners in general) in Sweden might have promoted some entrepreneurship in the Golden Age. For instance, high labour costs in wood industries were important conditions for *KEA*, an expansive retail-trade company in the Golden Age which later became a world success. Finally, welfare and employment policies may reduce the cost of entrepreneurial failure, thus, counter-balancing the stimulating effect on new firms from high rates of unemployment.

in the second half of the 1960s led to a sharp rise in firm concentration in Swedish manufactural branches (Rydén [1971, p. 64] and Rydén & Edberg [1980, p. 196]).

Barriers to entry became higher in Swedish manufacturing in the 1960s due to the growing importance of scale advantages (at imperfect capital markets) and firm concentration. Moreover, entry barriers to dynamic markets were raised by significant R & D expenditures by leading companies. The decline in entrepreneurship in the Golden Age was, to a large extent, a reflection of the large-scale character of Swedish industry, a pattern already settled before the age of discriminating profit taxes and labour priorities in politics. Thus, the lack of renewal in manufacturing is basically explained by the logic of the Swedish model.

In this paper, I have regarded the Swedish model as a strong version of a postwar accumulation model of mutual interests between labour and capital. In the Golden Age, a powerful labour movement accepted private sovereignty in the business sector and pursued policies to support industrial growth. Swedish industry reacted by accepting labour priorities and by (strategic) investments in the country.

Similar growth covenants have been analyzed in disparate academic traditions such as the sociological theory of “historical compromises” and the French regulation school. My contribution to the literature is to distinguish a leading industrial sector in Sweden. Export-orientated raw material industries and large outward companies in engineering are the Swedish growth engines. I have illuminated the forces behind the leading sector’s postwar success with a particular emphasis on economic policies.

The success of the large companies in Swedish engineering is explained by their early “outwardness” but also by public orders, economic policies (including devaluations and import restrictions) and corporate taxes. The companies’ innovative strength arose through a dynamic combination of foreign impulses and national systems of innovation.

The leading industrial sector was able to generate strong multiplier effects in the Golden Age. It was also differentiated enough to avoid serious current-account deficits and fluctuations in economic activity in Sweden. Furthermore, the large companies in engineering acted as effective producers and transmitters of new knowledge to the benefit of other Swedish companies.

However, there are indications that the growth potential of the Swedish model was largely exhausted already in the late Golden Age. Leading industries were threatened by some internal conflicts in the model (basically labour scarcity), market saturation, “primitive” foreign competition and technical restraints. In addition, the worse growth performance of Sweden from the mid 1970s had its origin in firm strategies and economic policies during the Golden Age. Specialization of large companies in engineering might have restricted promising growth trajectories. Furthermore, their foreign orientation delayed an up-grading of domestic suppliers. The significant increase in foreign plants made it also easier for the companies to invest abroad at the expense of investments in Sweden. Finally, the development of new firms and industries was hampered not only by the profound large-scale character of the Swedish model but also by biased corporate taxes and economic policies “locking in” resources in established companies and industries.

A question whether the Swedish model is still alive cannot be answered with a certainty of belief. Internationalization and ideological shifts have reduced both the leading companies’ interest in corporatist arrangements and also the general support of interventionist policy-instruments, at least on the national level. Finally, the companies in the Swedish model have been less able to work as effective growth and employment engines after the Golden Age. Most important, the car producers have been hit by periodical crises from the mid 1970s.

But it is too early to officially declare the Swedish growth model dead. The leading companies and industries in the Golden Age still dominate Swedish export, industrial production and R & D. They have not yet been superseded or complemented by new

growth engines. Besides, the support from economic policy to the leading industrial sector increased tremendously after the Golden Age. A free use of investment funds was permitted from the mid 1970s and the SEK was devaluated at five occasions 1976-1982. Moreover, “branches of crisis” such as iron and steel industries got immense financial support 1975-1982 and the car industry was given large regional subsidies during the peak of the 1980. I argue, in line with my discussion of the Golden Age, that these supports to leading companies and industries delayed the development of new growth engines. It remains, however, to tell the whole story about the Swedish growth model after World War II.

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Table 1: Fluctuations in Export and GDP Growth in the Golden Age and After (Constant Prices), 16 OECD Countries. Variation Coefficients (Per Cent)

	1954-1972		1973-1990	
	Export	GDP	Export	GDP
<b>Sweden</b>	<b>42</b>	<b>41</b>	<b>124</b>	<b>72</b>
Denmark	37	57	58	105
Norway	50	45	211	116
Finland(1)	75	51	164	67
Iceland	140	93	142	76
Germany	91	71	129	86
Austria(1)	74	40	72	67
Belgium	72	43	105	93
France(1)	65	22	80	59
Italy(1)	38	32	82	88
Netherlands(1)	40	49	94	82
Great Britain	69	52	98	114
Switzerland	79	77	126	181
USA	127	90	119	90
Canada	74	52	118	78
Japan(1)	51	31	98	47

(1) 1955-1973.

Sources: National Accounts of OECD Countries, Volume II, OECD (periodical).

**Table 2: Average Percentage Change In Export Volume in 15 OECD Countries, 1951-1958, 1959-1965 and 1966-1973. Annual Data.**

	1951-58	1959-65	1966-73
<b>Sweden</b>	<b>5,1</b>	<b>10,9</b>	<b>11,2</b>
Denmark	8,7	9,7	7,9
Norway	5,0	12,3	11,6
Finland	7,8	9,9	10,0
Germany	30,6	12,4	16,2
Austria	20,8	10,7	16,1
Belgium	7,6	15,8	16,4
France	5,1	13,3	15,8
Italy	12,5	27,1	15,1
Netherlands	12,5	12,9	18,9
Great Britain	1,3	4,3	8,7
Switzerland	9,4	10,6	11,9
USA	5,2	7,4	10,5
Canada	4,6	8,9	16,6
Japan	27,5	30,4	21,3

Source: Maddison [1982].

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**Table 3: Average Percentage GDP Growth in 15 OECD Countries, 1950-1958, 1958-1965 and 1965-1973. Annual Data.**

	1950-1958	1958-1965	1965-1973
<b>Sweden</b>	<b>3,5</b>	<b>5,9</b>	<b>3,7</b>
Denmark	2,6	6,6	5,0
Norway	3,9	5,1	4,7
Finland	4,7	7,0	6,0
Germany	10,5	7,0	4,9
Austria	7,6	5,3	6,6
Belgium	3,0	5,6	9,1
France	5,2	6,6	6,6
Italy	6,8	6,6	6,5
Netherlands	4,6	6,4	6,1
Great Britain	2,5	4,0	3,4
Switzerland	4,8	6,7	4,5
USA	3,4	5,1	4,3
Canada	5,9	5,9	6,7
Japan	11,1	14,2	15,4

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Sources: Maddison [1982].

**Table: 4 Changes in Value Added (Percentage Points) in Manufacturing as Ratio of GDP (Current Prices). 14 OECD Countries, 1960-1965 and 1965-1972**

	1960-1965	1965-1972 <sup>(1)</sup>	1960-1972
<b>Sweden</b>	<b>-0,8</b>	<b>-2,7</b>	<b>-3,5</b>
Denmark	-8,8	-3,0	-11,8
Norway	0	0,6	0,6
Finland	-1,3	3,0	1,7
Germany	0,2	-4,5	-4,3
Austria	-2,2	-0,1	-2,3
Belgium	-0,1	0,1	0
France	-0,4	-0,5	-0,9
Italy	-1,7	1,7	0
Netherlands	-2,6 <sup>(2)</sup>	-2,6 <sup>(3)</sup>	-5,2
Great Britain	-2,1	-2,7	-4,8
USA	-0,5	-3,8	-4,3
Canada	-0,5	-2,6	-3,1
Japan	-2,1	2,7	0,6

Notes: (1) 1973 is an exceptional year and has therefore been excluded here from the Golden Age 1960-1968. (3) 1968-1972.

Sources: OECD, Historical Statistics (periodical) and OECD, National Accounts of OECD Countries 1962-1979, Volume II (periodical).

**Table 5: Average Percentage Change in Real Value Added in Manufacturing in 14 OECD Countries, 1960-1965 and 1965-1972. Annual Data.**

	1960-1965	1965-1972 <sup>(1)</sup>
<b>Sweden</b>	<b>6,1</b>	<b>3,8</b>
Denmark	5,8	4,5
Norway	4,6	4,6
Finland	6,0	7,3
Germany	5,7	4,6
Austria	4,3	6,6
Belgium	5,9	6,8
France	7,7	7,7
Italy	7,0	7,2
Netherlands	5,9	6,1
Great Britain	3,1	2,2
USA	6,3	3,1
Canada	7,3	5,3
Japan	12,1	14,4

Notes: (1) 1973 is an exceptional year and has therefore been excluded from the Golden Age.  
Sources: OECD, Historical Statistics (periodical).

**Table 6: Raw Material Industries' Share of Gross Value Added (Current Prices) and Employment in Swedish Manufacturing in the Golden Age.**

	1951	1956	1961	1966	1970	1973
<u>Value Added</u>						
Wood Products	7,9	7,0	7,7	7,7	8,3	8,9
Pulp and Paper	17,1	8,4	6,7	5,9	7,8	7,9
Iron and Steel	5,0	7,5	7,8	6,9	7,9	6,6
<u>Total</u>	30,0(1)	22,9	21,5	20,5	24,0	23,4
<u>Employment</u>						
Wood Products	9,0	8,7	8,0	8,2	8,5	8,7
Pulp and Paper	5,7	6,5	6,8	6,4	6,0	6,2
Iron and Steel	6,5(2)	6,4	6,8	6,9	6,7	6,9
<u>Total</u>	21,2	21,6	21,6	21,5	21,2	21,8

Notes: (1) An exceptionally high figure during the Korean War. (2) 1952.

Sources: Swedish national accounts.

**Table 7: The Raw Material Industries' Share of Swedish Export of Commodities, (Value) in the Golden Age.**

	1946	1951	1956	1961	1966	1970	1973
Wood Products	11,4	12,3	12,3	8,6	7,2	6,7	7,9
Pulp and Paper(1)	36,6	42,2	28,2	22,6	20,0	17,3	16,1
Iron and Steel(2)	13,8	9,9	14,3	13,6	15,1	15,5	14,1
<u>Total</u>	61,8	64,4	54,8	44,8	42,3	39,5	38,1

Notes: (1) Printed matters are excluded (2) The group includes fabricated metal products except machinery and equipment, thus a branch of engineering according to the national accounts.

Sources: Trade statistics from Statistics Sweden.

	1966	1970	1973
AGA	n.a	0,5	0,5
Alfa-Laval	1,0	0,5	0,6
ASEA	2,9	3,0	3,3
Atlas Copco	0,5	0,4	0,5
Electrolux	0,6	1,2	1,3 <sup>(1)</sup>
Ericsson	2,1	2,8	2,9
Saab-Scania	2,3 <sup>(2)</sup>	2,6	3,0
SKF	1,4	1,4	1,3
Volvo	2,2 <sup>(3)</sup>	3,4	4,4
Total excl. AGA	13,0	15,2	17,4

Notes: (1) 1972. (2) The figures for Saab and Saab-Scania have been summed up, 1967.

Sources: See table 10.

Table 9: Eight Engineering Companies' Share of Swedish Export of Commodities (Value) 1966, 1970 and 1973.

	1966	1970	1973
Alfa-Laval	1,0	1,3	1,4
ASEA	3,3	3,4	3,2
Atlas Copco	1,4	1,3	1,2
Electrolux	0,7	0,9	1,8
Ericsson	2,3	3,1	3,6
Saab-Scania	1,7(1)	2,7	3,1
SKF	2,5	1,9	1,5
Volvo	5,7	7,3	8,4
<b>Total</b>	<b>18,6</b>	<b>21,9</b>	<b>24,2</b>

(1) The figures for Saab and Scania-Vabis have been added up.  
Sources: see table 10.

Table 10: Total Foreign Sales As A Ratio Of Total Sales From 9 Swedish Companies in Engineering (Value), 1951-1973

	1951	1956	1961	1966	1970	1973
AGA	n.a	n.a	n.a	61 <sup>(1)</sup>	67	67
Alfa-Laval	79	78	71	66 <sup>(2)</sup>	84	85
ASEA	n.a	n.a	n.a	40	44	52
Atlas Copco	n.a	79 <sup>(3)</sup>	81	85	89	90
Electrolux	n.a	83	77	67 <sup>(4)</sup>	66	71
Ericsson	n.a	n.a	65	61	73	82
Saab-Scania	n.a	n.a	n.a	26 <sup>(5)</sup>	36	40
SKF	n.a	n.a	n.a	92	92	97
Volvo	24	36	46	52	65	70
Total (excl. AGA)				61	67	71

Notes: (1) 1968. (2) 1965. The figure is 85 per cent if Olofström AB, sold in 1969, had been excluded. (Analogously, the figures for 1951, 1956 and 1961 would have been higher if this daughter company had been excluded.) (3) 1958. (4) The decrease from 1961 is mainly explained by the requirement of Electro-Helios (1962) and the exclusion of Electrolux Canada which formally was transferred to an independent company, Electrolux Corporation (1962). Electrolux sold its minority share (40 per cent) of Electrolux Corporation in 1968 (5) The figures for Saab and Scania-Vabis have been added up.

Sources: Annual Reports, Gårdlund [1973, statistical appendix] and Erixon [1988, pp. 79-81].

Table 11: Foreign Affiliates' Share Of Total Foreign Sales From 9 Swedish Companies in Engineering (Value), 1951-1973.

	1951	1956	1961	1966	1970	1973
AGA	n.a	n.a	n.a	n.a	n.a.	83
Alfa Laval	64	n.a	78	74	65	65
ASEA	n.a	n.a	n.a	25	26	38
Atlas Copco	n.a	n.a	n.a	63	67	67
Ericsson	n.a	n.a	n.a	59	53	55
Electrolux	n.a.	81	82	78	74	67
Saab-Scania	n.a	n.a	n.a	19	26	24
SKF	n.a	n.a	n.a	83	85	86
Volvo	0	0	n.a.	21	26	29
Total (excl.AGA)				59	55	54

Sources: See table 10.

Table 12: The Number Of Employees In Foreign Affiliates In Relation To The Total Number Of Employees in 9 Swedish Companies, 1951-1973.

	1951	1956	1961	1966	1970	1973
AGA	n.a.	n.a.	54 <sup>(1)</sup>	n.a.	62	61
Alfa -Laval	n.a.	57 <sup>(2)</sup>	51	46	64 <sup>(3)</sup>	62
ASEA	n.a.	12	9	14	17	18
Atlas Copco	n.a.	39 <sup>(4)</sup>	46	57	66	70
Electrolux	68	74	70	65	61	64 <sup>(5)</sup>
Ericsson	n.a.	n.a.	48	50	52	62
Saab-Scania	n.a.	n.a.	n.a.	7 <sup>(6)</sup>	7	9
SKF	68 <sup>(7)</sup>	72	72	78	77	80
Volvo	0	0	2	10 <sup>(8)</sup>	10	17
Total (excl. AGA):				46	45	49

Notes: (1) 1959. (2) 1957. (3) The sharp rise from 1966 is explained by the sell of Olofström AB to Volvo (1969). (4) 1958. (5) 1972. (6) The figures for SAAB and Scania-Vabis have been added up 1952. (8) 1967.

Sources: See table 10.

Table 13: Average Private Consumption Expenditures (Constant Prices) in Sweden 1950-1958, 1958-1963, 1963-1968 and 1968-1973. Annual Data.

	1950-58	1958-63	1963-68	1968-73
Electrical Equipment	20,6	6,9	-	-
Heating and Cooking Appliances, Refrigerators, Washing Machines and Similar Major Household Appliances Including Fittings	-	-	5,9	6,2
Sewing Machines and Vacuum Cleaners	3,6	3,6	-	-
Wireless and Television Sets and Gramophones	-	-	12,8	17,3
New Purchases of Cars	14,9	15,8	2,6	1,4
Total Private Consumption Expenditures in the Domestic Market	2,6	3,9	3,8	1,9

Notes: The classification of consumption goods was changed resulting in a time series break in 1963. Sources: Statistics Sweden (1975), "Final Consumption Expenditure 1950-1974". No N 1975:98, appendix 1.

Table 14: Percentage Change in Swedish Import in the Golden Age (Value).

	1946-48	48-50	50-52	52-54	54-59	59-65	65-70	70-73
Automobiles(1)	19	330	- 7	114	34	145	-18	48
Automobiles, including components(2)	81	139	16	83	24	108	3	47
Electrical Machines, Apparatus and Material	152	- 6	95	0	118	66	102	32
Total Import	46	23	47	3	36	81	52	28

(1) Include trucks and buses.

(2) Components of automobiles such as chariots, wheels and chassis.

Source: Swedish trade statistics.