

**After Years of (Economic) Solitude: Neoliberal Reforms and Pay
Inequality in Colombia**

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Abstract:

This paper presents an analysis of the evolution of pay inequality in Colombia's manufacturing sector from 1992-2004. Colombia's implementation of economic reforms, including the opening of the economy and the financial liberalization that began in the early 1990s, were the main drivers of change in the structure of the manufacturing sector, provoking fluctuations in pay inequality. Changes in pay inequality appear intrinsically related to macroeconomic phenomena: while GDP and investment were growing, pay inequality in the manufacturing sector decreased; conversely, under recessionary conditions we observe increases in pay inequality in manufacturing. At the sectoral level, we observe the declining importance (in terms of employment, production, and value-added) of labor-intensive, low-wage industries, and the rise of production in the high-wage natural resource processing industries.

I. Introduction

This paper presents an analysis of the evolution of pay inequality in Colombia's manufacturing sector during and after the period of liberalization. Trends in pay inequality mirror the changing conditions in major macroeconomic indicators. We pinpoint the specific manufacturing sectors that benefited from the opening of the economy and those that were damaged – the “winners” and “losers” of Colombia's globalization. This exercise is a cautionary tale: it illustrates the characteristic effects of globalization on an economy dominated by the extractive and agricultural sectors.

The paper is organized as follows: Section II contains a discussion of the methods and data sources used for measuring pay inequality using industrial data. Section III presents a brief overview of the Colombian macroeconomic context during this period. In the fourth section, we analyze the evolution of pay inequality in the Colombian manufacturing sector. The fifth and final section presents some preliminary conclusions.

II. Methods and data sources

To analyze the evolution of pay inequality in the Colombian manufacturing sector we compute the general trend of pay inequality as the between-group component of a Theil's T Statistic, using industrial classification categories as the group structure. This method enables us to compute the general trend in pay inequality as well as to pinpoint the contribution of each sub-manufacturing sector to the trend.

Theil's T Statistic for the population (T) is made up of two components, a between-group component (T^B) and a within-group component (T^W).

$$T = T^B + T^W$$

The between-group element of Theil's T Statistic can be written as:

$$T^B = \sum_{i=1}^m \left\{ \left(\frac{p_i}{P} \right) * \left(\frac{y_i}{\mu} \right) * \ln \left(\frac{y_i}{\mu} \right) \right\}$$

This component constitutes a lower-bound estimate of overall pay inequality (Theil 1972), since the within-group component is unobserved and omitted. However, for stable and sufficiently detailed group structure, the evolution of this measure over time is a robust estimator of changes in overall inequality within the population covered by the groups. In addition, the measure is constructed in such a way as to permit detailed analysis of the relative performance of the underlying groups, and their changing contribution to overall inequality.

For example, consider two industries: one with an income above the mean income ($Y_i > \bar{Y}$) and one with an income below the mean ($Y_i < \bar{Y}$). The "contribution" of each to Theil's T Statistic is the product of three terms: a population weight, the ratio of Y_i to \bar{Y} , and the log of that same ratio. The contribution of the former to the Theil's T Statistic is positive, while the contribution of the latter is negative; thus the "high wage" groups in society (groups with above average income) are positive contributors to Theil's T

Statistic, while “low wage” groups (groups with below average income) are negative contributors. In addition, one can see that a decline in inequality, measured by Theil’s T Statistic, can be caused by low wage groups either losing employment or improving themselves relative to the mean, or by high wage groups also either losing employment or falling back toward the mean. As will be seen below, being able to distinguish these patterns is important for understanding the recent experience of Colombia.

The data are taken from the Annual Manufacturing Survey of Colombia (“Encuesta Anual Manufacturera,” henceforth EAM) supplied by the National Department of Statistics (“Departamento Nacional de Estadísticas” henceforth DANE). The dataset selected for this analysis begins in 1992 and ends in 2004.

We collected grouped data on wages and employment by manufacturing sector. Despite the advantages and flexibility of using this type of semi-aggregated data there are still problems and concerns. Specifically, there was a change in the United Nations’ International Standard Industrial Classification (ISIC) of all economic activities when the UN moved from ISIC 2 to ISIC 3 in 1993. DANE adopted ISIC 3 in 2000, expanding its industrial classification from 29 to 63 sub-manufacturing sectors. This causes a break in the data series and a spurious rise in measured inequality, since some inequality formerly hidden “within groups” is now transferred to the “between groups” measure.

Three approaches were available for analyzing these data: (1) using two separate calculations to obtain separate trends, one from 1992 to 1999 with 26 manufacturing sectors at the two-digit level and the second from 2000-2004 with 63 manufacturing sectors at the three-digit ISIC level; (2) using one calculation, merging the trends at a two-digit ISIC level, using available cross-referencing between the two standards to

combine ISIC 2 data with ISIC 3 data; and (3) using one calculation, merging the trends at a three-digit level, collating ISIC 2 with ISIC 3 data. The third option was selected; it provides the highest level of detail and allows for a single, continuous trend across the period of study.¹

III. Overview of the Colombian Economic Context

This section briefly describes the institutional and macroeconomic context that conditioned the performance of the manufacturing sector in Colombia from 1992 to 2004. The beginning of the 1990s will be remembered as a period of great institutional reforms within the Colombian economy. The principal facets of reform were the design of a new Constitution (1991) and the implementation of a neo-liberal economic order through President César Gaviria's National Plan of Development (1990-1994).

While the new Constitution claimed a larger role for the state in overcoming the institutional crisis caused by social problems and armed conflicts, the economic reforms in Gaviria's Plan aimed for a smaller role for the state, in hopes of stimulating the economy (Ocampo 2004, p. 17). In less than one year the state abandoned its pragmatic and gradual approach, which had historically characterized Colombia's political economy, in favor of a radical approach which had been based on a theory whose validity had neither been examined nor evaluated in practice (Sarmiento 1998, p. 84).

¹ The merging process was done using the appendix 9 "Correlation between ISIC rev.2 and ISIC rev.3" provided in the methodological appendix of the 2005 EAM available at http://www.dane.gov.co/files/investigaciones/mmm/anexo_metodologico2005.pdf. Latest access on January 20, 2008.

Table 1 – The Constitution of 1991

The Constitution of 1991 was the product of the National Constituent Assembly convened through the elections of December 9th, 1990. In the Assembly, the participants searched for a solution to the structural crisis of the political and social regime that would obey the agreements made through negotiations with demobilized sectors of the insurgency. The new structure of the Constitution reflects a political consensus, and as a result, it includes an amalgamation of conservative, liberal and social democratic views.

In the new Constitution, Colombia's government is defined as a welfare state based on the rule of law (Estado Social de Derecho) in which the essential mission of the state is to “promote the general well-being and the improvement of the quality of life of the population.” It also includes a complete series of economic and social rights, both general and specific, that were excluded from the previous Constitution. Among these are the rights to health, education, culture and recreation, a dignified life, social security and work. Specific benefits are also established for children, the elderly, and agricultural producers, among others.

With respect to the economic model, in this Constitution we encounter constituent norms in a general sense without specific orientation to the economic model. In this way, the Constitution concedes to the state ample room for configuration and development of a specific economic model through the ‘Development Plans’ of each government. These plans detail: (a) national goals and objectives for the long term, (b) goals and priorities of the Colombian state for action in the medium term, and (c) political strategies for the economy, the society, and the environment.

As a result, the consensus reached by the Constituent Assembly enlarges the sphere of state intervention but with a modern spirit: the state may allow private participation in activities that were traditionally reserved for the public sector, and can force the public sector to be efficient and to compete whenever possible. In the ‘Development Plan’ of the Gaviria administration, and also in the administrations that followed, an effort was made to limit the areas of state action and to fortify the role of markets in the allocation of resources.

Sources: Ocampo (2004), Estrada (2004), Tobon (2002), UNEB (2005).

From the viewpoint of the Colombian government, the economic reforms to be implemented sought to respond to the economic stagnation which had occurred at the end of the 1980s. In the official diagnosis of the situation, the main causes of stagnation were the gradually increasing closure of the economy to international trade and the inefficient intervention of the state in strategic sectors of the economy (DNP 1991). The first

generation of neoliberal reforms implemented in Colombia occurred a few years later in the early 1990s. They are outlined in Table 2.

Table 2 – Principal Economic Reforms of Colombia		
Labor Market	Law 50 of 1990 Law 100 of 1993	Reduction in costs of hiring and firing. Legalization of contracts for periods of less than a year. Reduction of non-salaried labor costs. Creation of private pension funds. Expansion of private health care and social security.
Market of Goods and Services	Law 49 of 1990 Law 7 of 1991	Opening to foreign direct investments with sectoral exceptions. Trade Deregulation. Reduction and homogenization of tariffs. Law on Foreign Trade, promotion of free trade of goods, services and technology. Creation of free trade zones and special schemes of import-export.
Capital Markets	Law 45 of 1990 Law 9 of 1991	Financial liberalization. Institution of full service banking and the integration of financial activities. Elimination of state monopoly over the control of exchange rates. Deregulation of capital markets.
Fiscal Policy	Law 49 of 1990	Tax structure based on indirect taxes. Decentralization of public spending and a method for assigning resources to territorial entities. Targeted policies for social spending.
Monetary Policy	1991	Independence of the Central Bank with the sole objective of preserving the purchasing power of the domestic currency through price stability.
Deregulation	1989-1994	Deregulation of telecommunications, health care, social security and higher education. Privatization of state-owned enterprises in multiple sectors.
Sources: Estrada (2004), Robbins (2003).		

While the Colombian economy of the second half of the 20th century did not enjoy rates of growth greater than the average Latin American country, it did not suffer a single great crisis during this long period. This rare stability diminished with the introduction of reforms, and these eventually led the country to the most severe economic crisis in its history in 1999. Thus, the policies of reform, promoted in the region by various international organizations at the beginning of the 1990s, were unable to produce an appropriate macroeconomic environment for investors and firms to encourage and support the creation and expansion of domestic productive capacity (UNCTAD 2003; p. 128).

The opening of the economy included unilaterally reducing the levels of the average tariff rate from 38.3 percent to 11.7 percent from 1990 to 1992, thus creating a strong disequilibrium in the tradable sector (Sarmiento 1998, p. 54). In these years, exports grew at a rate of 2 percent annually, while imports grew at a rate of 24 percent (UNCTAD 1999, p. 115). The result was a rapid deterioration of the current account in the balance of payments, which fell from a surplus of 5 percent of GDP in 1990 to a deficit of 4 percent of GDP in 1992 (Echeverry 2002, p. 70).

The slow reaction of exports was due mainly to two factors. First, the rapid liberalization of the goods market favored activities with comparative advantages, which however faced saturated and competitive international markets. Their growth was clearly limited by demand (Sarmiento 2002). Second, the deregulation of international capital inflows that occurred parallel to the process of liberalization resulted in a substantial increase in foreign capital inflows: whereas, in 1990 there was a \$2 million outflow, in 1993 there was an inflow of \$2.7 billion dollars (CEPAL 2001, p. 458). The large foreign

capital inflows produced a significant appreciation in the real exchange rate of approximately 24 percent in this period (UNEB, p. 42). Another unwanted effect of the influx of capital into Colombia was the rapid expansion of bank credit, which grew on average by 10 percent annually in real terms during the first half of the decade (UNEB 2005, p. 36).

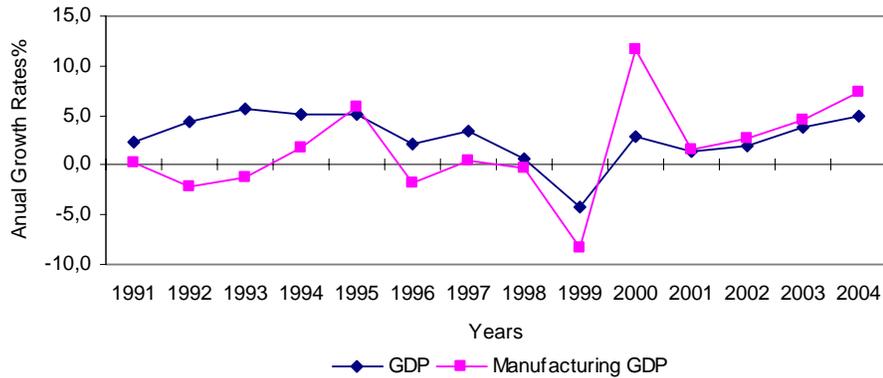
The jump in the level of liquidity in the economy caused a relaxation of credit standards that led to the creation of a bubble in the real estate market and to unsustainable growth in household consumption. This was reflected in private savings, which fell 5 percent from 1990 to 1995, and in a doubling of the consumption of imported goods.

Furthermore, the rapid expansion of credit sparked inflation, which the authorities of the Bank of the Republic sought to control by raising real interest rates. From 1992 to 1995 real interest rates quintupled, rising from 4 percent to 20 percent (Echeverry 2002, p. 147). This strategy was self-defeating for two reasons. First, the rise in the interest rate stimulated more inflows of foreign capital into the country, which put further pressure on the exchange rate and increased the liquidity of the banking system. Increased liquidity in turn exacerbated the credit boom, increasing the system's fragility. Secondly, the rise in interest rates was destroying the national productive apparatus already suffering from liberalization and from the process of exchange-rate revaluation.

The final straw for Colombia's economy came in 1997, as a result of the East Asian financial crisis. The sharp increase in risk aversion of international investors prompted a massive withdrawal of capital from Colombia, which added pressure to raise the Colombian exchange rate in a moment when the current account deficit was at a historical high of 6.3 percent of GDP.

In a desperate attempt to impede collapse, the Bank of the Republic instituted an unprecedented restriction of the monetary base, forcing the interest rate to levels higher than 25 percent at the beginning of 1998 (Echeverry 2002, p. 67). The sudden rise in the interest rates, now without foreign investment, resulted in a severe credit crunch that burst the economic bubble and plunged the country into the worst crisis in its history. GDP fell by 9 percent from 1998 to 1999.

Figure 1: GDP and Industrial GDP Annual Growth Rates, Colombia 1991 – 2004

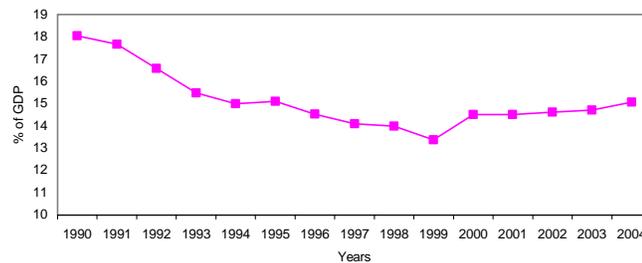


Source: Dane

As can be seen in Figure 1, the economy began a steady recovery from the crisis in 2002, after which an accumulation of factors had permitted the maintenance of an average growth rate of 4.38 percent between 2002 and 2006. Among these factors were a benign international context, high commodity prices, and an expansive monetary policy (CID 2006).

The manufacturing sector was not exempt from the effects of macroeconomic events that shaped the evolution of the economy during the period of study. As shown above on Figure 1, the manufacturing sector during the 1990s produced rates of growth consistently less than those of the overall economy: since 2000, the rate of growth in manufacturing GDP has outpaced that of the general economy. Despite this positive recent trend, there was a reduction in the manufacturing sector's contribution to GDP during the overall period of study, as shown in Figure 2.

Figure 2: Manufacturing Sector Share of GDP (Constant Prices 1994)



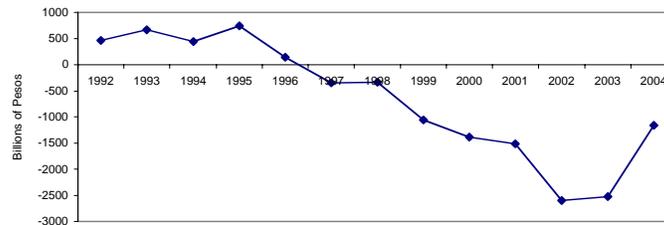
Source: Dane

The decline in the manufacturing sector's share of GDP is associated with the difficulties it encountered confronting the opening of the economy, including: (a) currency overvaluation during most of the period; (b) decreasing access to credit due to higher interest rates; and (c) significant compression in the internal market as a consequence of the crisis at the end of the 1990s.

Rather than creating conditions conducive to investment and capital accumulation (therefore, promoting production diversification, growth of value-added, and industrial

productivity), the reforms implemented in early 1990s produced an economic context characterized by uncertainty.¹ The results may be observed in the behavior of investments in the manufacturing sector: since 1997, net investment in the manufacturing sector maintained a negative balance, as shown in Figure 3. This de-capitalization of Colombia's industry is clearly related to the decline in the contribution of the manufacturing sector to GDP.

Figure 3: Net Investment in Colombia's Manufacturing Sector

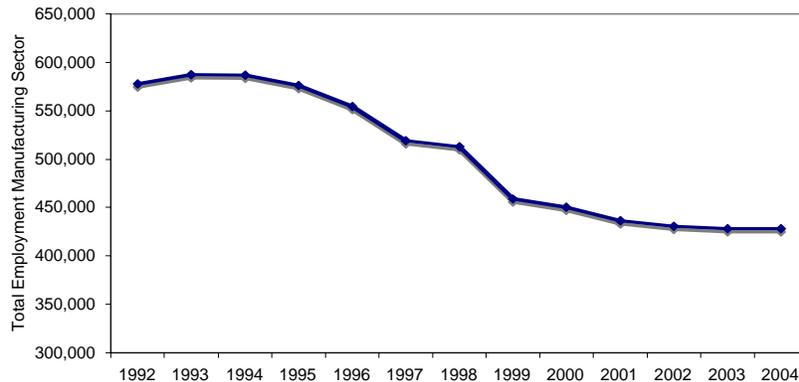


Source: EAM

In turn, this process led to a dramatic decline in the number of jobs in the manufacturing sector. During the period of study the labor force shrunk a stunning 25.8 percent. Approximately 150,000 jobs were lost between the years 1992 to 2006 as can be seen in Figure 4.

¹ According to a business survey conducted by Fedesarrollo during the 1990s, the main obstacles to invest in Colombia were its low levels of internal demand as well as uncertainty regarding its future evolution. More information available at the Departamento Nacional de Planeación (http://www.dnp.gov.co/paginas_detalle.aspx?idp=42).

Figure 4: Manufacturing Sector Employment



Source: DANE

Using this understanding of the macroeconomic conditions of Colombia, the next section of this paper seeks to analyze how this context shaped the trends of pay inequality of the manufacturing sector during the period of study.

IV. Pay inequality in the manufacturing sector in Colombia, 1992-2004

This section evaluates the change in pay inequality in Colombia's manufacturing sector from 1992 to 2004. While the economic difficulties of Colombia during and after the economic reforms are well known, we know much less about the relative winners and losers during this period. While Colombia's economy as a whole suffered, there were actually some sectors of the economy that performed well. The result was a change in the pattern of inequality in Colombia that has gone unobserved. This paper attempts to shed some light on that changing pattern.

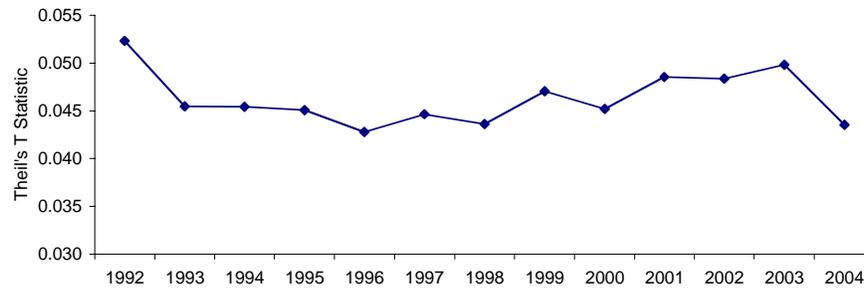
We use the between-group component of Theil's T Statistic to calculate the general trend in pay inequality, and the contributions of each sector to that component to

illustrate the pattern of “high wage” and “low wage” manufacturing sectors. This method enables us to obtain a complete representation of the relative changes in wages and employment in different manufacturing sectors. The changes in any given manufacturing sector’s position may be explained as a change in wages and employment in that sector or as the result of changes in wages and employment in some other sector(s). For example, a boom in oil prices that increases employment and wages in that sector may alter the relative positions of all the rest of the manufacturing sectors by changing the position of the average wage.

A. General Trend in Pay Inequality

Figure 5 shows the general trend of pay inequality in the Colombian manufacturing sector over a period of 12 years. From 1992 to 1996 inequality levels are decreasing. After 1996 we see an upward trend that is maintained until a peak is reached in 2003. There follows a precipitous drop in 2004. Overall, inequality in Colombian manufacturing pay is lower in 2004 than in 1992 although, this effect depends entirely on the drop in 2004.

Figure 5: Pay Inequality in the Colombian Manufacturing Sector



Source: Authors' calculations based on DANE data

B. Contributions of Manufacturing Sub-Sectors

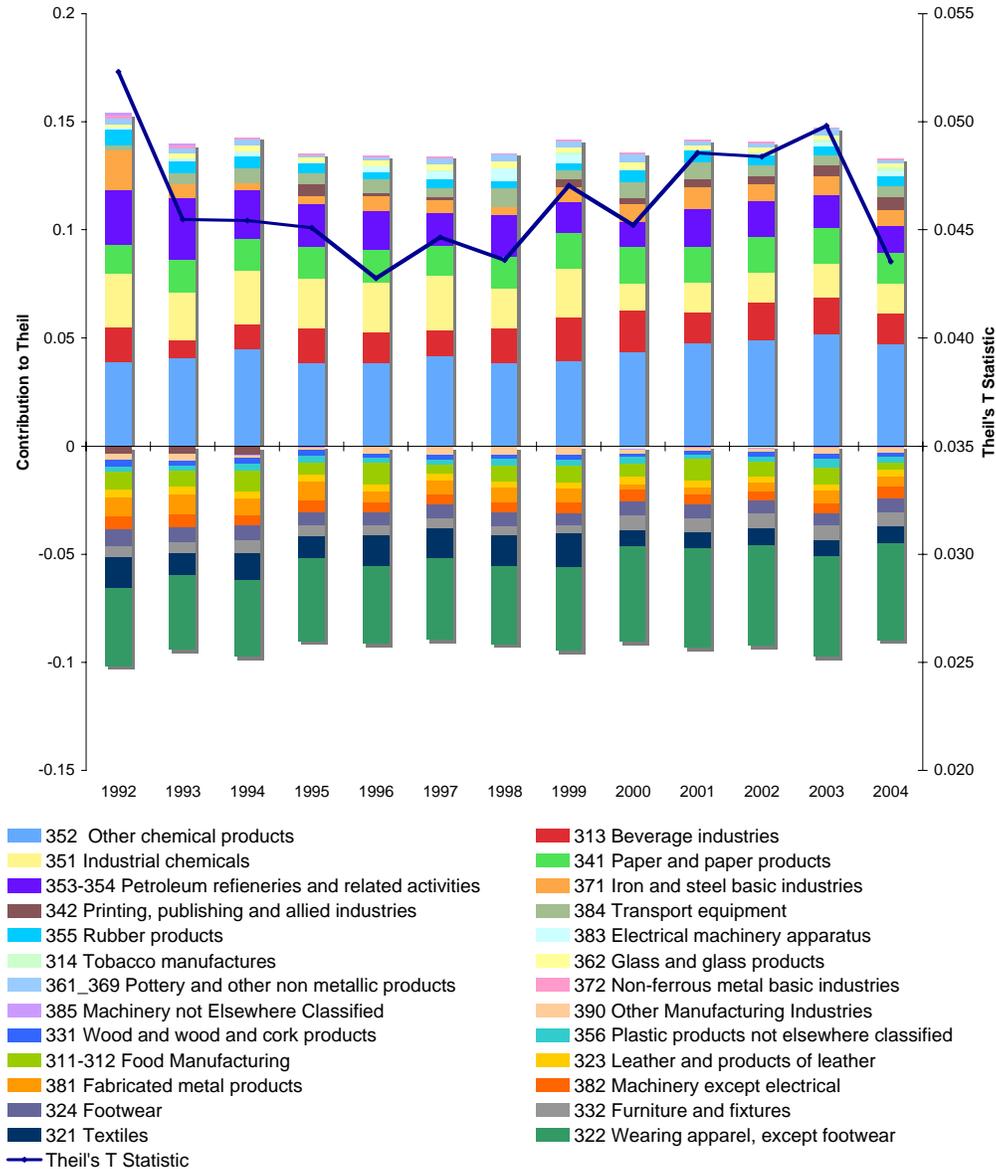
Figure 6 shows the individual contributions of various sub-sectors to overall pay inequality in the Colombian manufacturing sector over a period of 12 years.

Because of the complexity of this figure a few words of explanation are in order. Interpretation of the figure revolves around the zero line of the graph. Positive contributors – those sectors in which wages earned were above average and therefore served to increase inequality - are portrayed above the zero line and we may call them “high wage” groups. Conversely, negative contributors – those manufacturing sectors with wages below the national average - are portrayed below the zero line of the graph and may be called the “low wage” groups. For both high and low wage sectors, the size of a sector’s contribution reflects the number of people employed in that sector. Even though we include a full range of manufacturing sectors in the analysis, for the purposes of this paper we will concentrate on the top five high wage sectors and the lowest five low wage sectors.

As demonstrated in Figure 6 the top five high wage sectors consistently include the following: beverage production (313); paper production and related products (341); chemical industrial products (351); other chemical products (352); and petroleum refinery/manufacture of miscellaneous products of petroleum and coal (353/354). All of the high wage sectors, with the exception of sector 313, are concentrated within section IV of the UNIDO industrial classification system, namely, the Natural Resources Processing Industries.

Figure 6 also shows the five consistent low wage sectors: food manufacturing with the exception of beverages (311-312); manufacturing of textiles (321); manufacture of wearing apparel, but not of footwear (322); manufacture of footwear, but not vulcanized or molded rubber or plastic footwear (324); and manufacture of fabricated metal products, but not machinery and equipment (381). Low wage sectors with the most negative contribution, 321, 322 and 324, are concentrated within section V of the UNIDO industrial classification system, namely, the Traditional Labor Intensive Industries. The combination sector, 311-312, is concentrated within sector III, more specifically known as the Food, Beverages and Tobacco, while sector 381 is within group I, classified as the Metal Working Industry.

Figure 6: Contribution to Pay Inequality by Manufacturing Sub-sector



Source: Authors' calculations based on DANE data

When we associate the general trend in pay inequality with the evolution of the macroeconomic context we observe that the tendency toward lower levels of inequality from 1992 to 1996 is related to a period of economic growth and to high levels of

investment. This benign economic context was characterized by a high rate of investment in the manufacturing sector that allowed the levels of employment which had existed at the beginning of the period to be sustained (Figure 4). However, there was a redistribution of employment among low and high wage sectors.² Between 1992 and 1996 there was a small reduction in the employment of the low wage sectors while there was also an increase in the employment of the high wage sectors. In terms of wages, there were no significant changes in the share of wage structures in either group of the manufacturing sector.³ The contribution to Theil's T Statistic from the main high and low wage sectors remained stable in this period.

Therefore, the main reasons for the downward trend in inequality are the diminished contribution of a high wage sector, namely that of the iron and steel manufacturing (371) along with a compression of the contribution of other minor Theil components.

In the second phase, from 1997 to 2003, marked by an increasing trend in inequality, there is a marked decrease in investment in the manufacturing sector and a severe recession in the economy. At the sectoral level, this upward trend in inequality is related to the increasing contribution of a high wage sector (352) and of a low wage sector (322). The increasing shares of employment and wages of these two sectors explain the increase in the contribution of both sectors to overall inequality.

The rapid change that occurred in 2004 is related to an improvement of the macroeconomic context, characterized by a stable and relatively high rate of GDP growth, and a rebound in the levels of investment.⁴ At the sectoral level, the downward trend in inequality is related to the decreasing contribution of the high wage sectors. This

² Selected employment data used in the elaboration of the calculations is shown in appendix 1.

³ Selected wage data used in the elaboration of the calculations is shown in appendix 2.

⁴ Although, it is worth noting that net investment in 2004 remained in negative levels, as shown in figure 4.

implies that the reduction in inequality was part of an overall reduction in income in the sectors with above average wages. In a context of a large loss of employment in the manufacturing sector, especially in low wage sectors as such, it does not represent a positive trend.

C. Pay Inequality and Structural Transformation

The most striking feature of the analysis of the evolution of pay inequality is the massive loss of jobs in the sector during the period. In this sense the shrinking of employment in the sector is related to an ongoing structural transformation in terms of production and value added within the national industry. Table 3 shows the evolution of shares from the main high and low wage sectors in relation to Colombian industrial production. We first note the reduction in the contribution of the low wage sectors by 5.8 percentage points, and an increasing contribution of the high wage sectors by a similar quantity, 5.2 percentage points, during the period of study.

Table 3 - Selected Sub-Sectors' Shares of Industrial Production

	1992	1996	1999	2003	2004
<i>Main Low Wage Sectors</i>					
Food manufacturing, excluding beverages (311-312)	25.4%	26.5%	29.3%	25.4%	24.2%
Manufacture of textiles (321)	7.6%	6.0%	4.8%	4.2%	4.1%
Manufacture of wearing apparel, excluding footwear (322)	3.3%	3.1%	3.3%	4.0%	4.1%
Manufacture of footwear, excluding vulcanized or molded rubber or plastic footwear (324)	1.3%	0.8%	0.5%	0.6%	0.6%
Manufacture of fabricated metal products, excluding machinery and equipment (381)	3.2%	3.4%	2.5%	2.1%	2.1%
Total, Low Wage Sectors	40.8%	39.8%	40.4%	36.2%	35.0%
<i>Main High Wage Sectors</i>					
Beverage industries (313)	7.1%	7.0%	7.2%	5.7%	5.2%
Manufacture of paper and paper products (341)	4.5%	4.5%	4.4%	5.1%	4.8%
Manufacture of industrial chemicals (351)	6.2%	5.6%	5.8%	4.4%	4.4%
Manufacture of other chemical products (352)	7.6%	8.3%	9.6%	9.5%	9.0%
Petroleum refineries (353) and Manufacture of miscellaneous products from petroleum and coal (354)	3.9%	6.4%	8.0%	10.2%	11.1%
Total, High Wage Sectors	29.3%	31.8%	35.0%	34.9%	34.5%

Source: EAM

If we concentrate our attention on the distribution of the decline in the share of low wage sectors in industrial production, we see a significant reduction in textile production (3.5 percent), and a smaller reduction in other sub-sectors. It is clear that the increasing share of high wage sectors in industrial production is due to the rapid growth of production within oil refineries (353-354), which grew by 7.2 percent. It is interesting that within this group there were also reductions in the share of total production from the beverage industry (313) and from industrial chemical production (351) by approximately 2 percent in both cases.

In terms of production, the increased role of Group IV, the Natural Resources Processing Industries within the manufacturing industry in relation to Colombia's total

industrial production epitomizes the overall decline of Colombia's industrial activity. Group IV increased its participation in total production by 7 percent, representing 23.1 percent of production in 1992 and 31 percent in 2004.⁵ This remarkable rise indicates the rapid increase of activity within the oil sector and its derivatives.

It is worth noting that the increase in the contribution of Natural Resources Processing Industries took place in the context of a reduction in the manufacturing sector's contribution to GDP by 4 percent. This happened because other manufacturing sectors saw their contribution to total production fall by approximately 3 percent. This is illustrated in the case of the metallurgy sectors.⁶

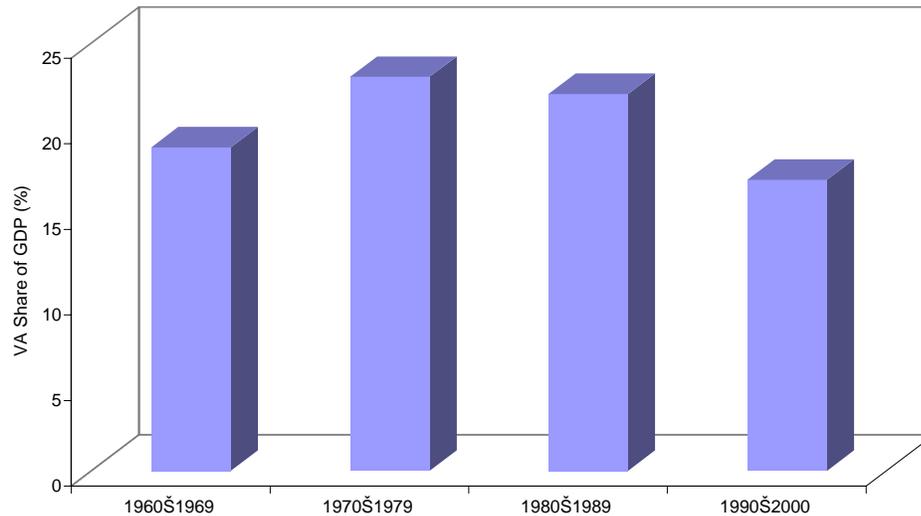
The weakening of the Colombian industry is also reflected in the dynamics and sectoral distribution of the value-added share in the manufacturing sector. As shown in Figure 7, during the 1990s the contribution of the manufacturing sectors value-added share decreased by 5 percent as a share of GDP.

The fact that the decrease in the contribution of the value-added share of the manufacturing sector to GDP was greater than the contribution of the manufacturing sector to industrial production demonstrates the process of productive reorientation ongoing during the years of reform. The dynamic factors of the opening of the economy and the appreciation of the exchange rate facilitated the replacement of Colombia's chains of production with imported products.

⁵ Authors' calculation based on DANE data using UNIDO classification system provided on UNCTAD (2003).

⁶ Manufacture of Fabricated Metal Products, Machinery and Equipment composed by sectors 381, 382, 383, 385.

Figure 7: Manufacturing Value Added as a Share of GDP, Colombia



Source: UNCTAD (2003)

At the sectoral level, the decrease in the share of manufacturing value-added to GDP is characterized by a re-distribution of value-added shares that parallels the variations in the distribution of industrial production during the study period. Table 4 shows the textile and food sectors' decline in contributions to manufacturing value-added shares. The decline is similar in proportion to that observed in terms of production. For the high wage sectors there is a significant 10.3 percent increase in the contribution of oil refineries and derivatives production, while there were significant reductions in the contributions of other sub-sectors. These changes confirm the growing importance of natural resources processing industries within Colombia's manufacturing sector, but to the detriment of other sub-sectors.

Table 4 –Selected Sub-Sectors’ Shares of Manufacturing Value Added

<i>Main Low Wage Sectors</i>	1992	1996	1999	2003	2004
Food manufacturing, excluding beverages (311-12)	19.1%	20.2%	22.3%	18.6%	17.8%
Manufacture of textiles (321)	7.9%	6.7%	5.1%	4.1%	4.0%
Manufacture of wearing apparel, excluding footwear (322)	3.7%	3.5%	3.3%	4.4%	4.3%
Manufacture of footwear, excluding vulcanized or molded rubber or plastic footwear (324)	1.2%	0.8%	0.6%	0.6%	0.6%
Manufacture of fabricated metal products, excluding machinery and equipment (381)	3.3%	3.8%	2.7%	2.1%	2.0%
Total, Low Wage Sectors	35.2%	35.0%	33.9%	29.8%	28.6%
<i>Main High Wage Sectors</i>					
Beverage industries (313)	10.7%	10.0%	10.5%	9.0%	8.5%
Manufacture of paper and paper products (341)	3.7%	4.3%	4.2%	4.6%	4.5%
Manufacture of industrial chemicals (351)	6.2%	4.9%	5.2%	3.8%	3.1%
Manufacture of other chemical products (352)	9.4%	10.5%	11.7%	11.6%	10.8%
Petroleum refineries (353) and Manufacture of miscellaneous products of petroleum and coal (354)	2.2%	6.3%	8.2%	10.0%	12.5%
Total, High Wage Sectors	32.2%	36.0%	39.7%	39.2%	39.5%

Source: EAM

Foreign trade is one of the principal factors that allows us to explain the aforementioned changes in terms of production and the creation of value-added shares. Between 1991 and 2005, gross industrial production increased by 62.4 percent, whereas consumption of industrial goods increased 84.7 percent. The gap was filled with an increase in imports (CID 2006).

At the same time, the rapid increase in imports was reflected in the behavior of the manufacturing sector’s import coefficient, which went from 35.1 percent in 1992 to 51.7 percent in 2004.⁸ The increase in imports reflects the diminishing use of Colombian industrial inputs in favor of imported inputs. As such, the increase in imports may be the

⁸ Authors’ calculations based on DANE data.

main factor behind the decrease in the contribution of Colombia's manufacturing value-added shares to GDP during the period of study.

The sectoral analysis demonstrates that the ability to compete in international markets is a key element that differentiates the high wage sectors from low wage sectors. The high wage sectors had export growth rates that exceeded those of imports on average during the entire period of study. Conversely, in the low wage sectors import growth rates exceeded those of exports by a wide margin, with the exception of the manufacture of wearing apparel (Group 322).

Nevertheless, both groups sustained a commercial deficit during the entire period of study. At the sectoral level, only Food manufacturing (311-312), Manufacture of wearing apparel (322) and Petroleum refineries (353-354) produced a surplus. The principle reason for this behavior is that in the majority of cases, large commercial deficits already existed at the beginning of this period of study.⁷ In the first years after the opening of the economy, a rapid increase in imports created absolute differences that grew incrementally in the case of the low wage sectors and slowly diminished in the case of the high wage sectors.

These results are not surprising; especially those of the low wage sectors, which, with the exception of industrial group 381, all rely heavily on manual labor. These sectors faced saturated and highly competitive world markets, which clearly restricted their ability to expand. At the same time, with the liberalization of the economy, these sectors saw their participation in local markets decrease due to the introduction of external

⁷ As the technological complexity of Colombia's industrial sector increases, the sector's trade deficit also increases, reflecting the country's low level of industrialization (Sarmiento 2002; Chapter 7).

competitors, as shown by the decreasing contribution of the industrial sector to Colombia's GDP.

As a consequence of this process, employment in the manufacturing sector decreased. The workers most affected by the reduction in employment in the manufacturing sector were those workers employed in the main low wage sectors. Of the estimated 150,000 jobs lost between 1992 and 2004, 87,000 belonged to the low wage sectors groups as a whole.⁸ From these, 75,000 jobs belonged to the 5 main low wage sectors. On the other hand 63,098 jobs were lost in the high wage group as whole,⁹ from which 21,000 correspond to the main high wage groups.

V. Conclusions

The main elements of this research can be summarized as follows:

Pay inequality trends in the Colombian manufacturing sector during the period of study (1992-2004) seem to closely follow the evolution of the overall economy. While GDP was growing rapidly and industrial production and investment were recovering between 1992 and 1996, we observe a reduction in the levels of pay inequality in the manufacturing sector. Conversely, during the recession stage from 1997 to 2003, we observe an increment in the levels of pay inequality in the manufacturing sector.

Our findings corroborate the Keynesian theory of income distribution for an economy that lacks a developed industrial sector: higher levels of aggregate spending and

⁸ The group of low wage sectors is composed by sectors 311-312, 321, 322, 323, 324, 331, 332, 356, 381, 382, 385, 390.

⁹ The group of high wage sectors is composed by sectors 313, 314, 341, 342, 351, 352, 353-354, 355, 361-369, 371, 372, 383, 384.

growth have a positive effect on equality. Similar results have been observed in the manufacturing sectors of Mexico and Brazil (Galbraith et al. 1998).

At the sectoral level the data demonstrate an increasing contribution from the Natural Resources Processing Industries in both production and added value. This increase comes at the expense of other industries as their contributions diminish in the context of decreasing industrial production in the economy and massive loss of employment.

The numbers suggest that the main factors behind the changes in the structure of the industrial sector were the opening of the economy and the financial liberalization that occurred at the beginning of the 1990s. The combination of the abrupt reductions in tariffs with the rise in interest rates and appreciation of exchange rates during the first half of the 1990s spurred the replacement of Colombian industrial inputs with imported inputs. This is also reflected in the increase of the import coefficient in the industrial sector by 16.6 percent and a reduction of the value added by 6 percent during the period of study.

The sectors most affected by this dynamic factor were the Labor Intensive Manufacturing Industries, for which the import growth rate was higher than that of exports in all cases. Workers in these sectors were affected not only in that they received the lowest wages in the economy, but also by the massive loss of employment. High wage sectors enjoyed a significant increase in their exports and in their contribution to industrial production. However, the sectors' limited absorption capacity for additional employment is one of the explanations for the slow recovery in employment in the industrial sector.

The fact that Colombia is specializing in industrial sectors with low employment generation and productivity growth represents an extremely negative trend for Colombia's unskilled workers who make up the vast majority of the Colombian labor market. Not only is it becoming more difficult for these workers to find employment in the formal economy, but the jobs that can be obtained also share two common characteristics: low pay and low growth prospects. As such, the downward trend in inequality during the period of study does not take place for the ideal reason -- growth in real wages in the manufacturing sector and low wage sectors "catching up" to high wage sectors -- but rather as a consequence of the stagnation of industrial wages and the reduced contribution in both employment and wages of the winning sectors.

Perhaps the most troubling observation is that even if Colombia were to implement drastic changes in its industrial policy in order to foster the insertion of the country into more dynamic sectors, China stands in the way. China's massive industrialization represents a serious obstacle for the industrial development of other countries that want to implement strategies of industrialization focused on international markets but have low levels of industrial development, such as Colombia (Kaplinsky 2005). From this view, the prospects for Colombian industrial workers in terms of employment and wage growth are not encouraging.

References

Comisión Económica para América Latina y el Caribe (CEPAL), Anuario Estadístico de América Latina y el Caribe 2001, Santiago de Chile: CEPAL (2001).

Departamento Nacional de Planeación (DNP), “La Revolución Pacífica,” Bogotá D.C: (1991).

Echeverri, Juan C., “Las Claves del Futuro, Economía y Conflicto en Colombia,” Bogotá D.C: Editorial Oveja Negra (2002).

Estrada, Jairo, “Construcción del Modelo Neoliberal en Colombia: 1970-2004,” Bogotá D.C: Editorial Aurora (2004).

Galbraith, James K., Pedro Conceição, and Peter Bradford, "The Theil Index in Sequences of Nested and Hierarchical Grouping Structures: Implications for the Measurement of Inequality Through Time, With Data Aggregated at Different Levels of Industrial Classification," *Eastern Economic Journal*, 27(4), (2001): 491-514.

Galbraith, James K., and Pedro Conceição, “Constructing Long and Dense Time Series of Inequality using Theil Index,” Working Paper No 1, University of Texas Inequality Project (UTIP): 1999.

Galbraith, James K. and Maureen Berner(eds), “Inequality and Industrial Change: A Global View”, Cambridge University Press (2001).

Galbraith, James K., Laura Spagnolo and Sergio Pinto, “The Decline of Pay Inequality in Argentina and Brazil following the Crises and Retreat from the Neo-liberal Model,” Working Paper No 34, University of Texas Inequality Project (UTIP): 2006.

Galbraith James K., Paulo Du Pin Calmon, Pedro Conceição, Vidal Garza Cantu & Abel Hibert Review, The Evolution of Industrial Earnings Inequality in Mexico and Brazil, of *Development Economics* 4 (2), 194–203, 2000.

Galbraith, James K., The distribution of Income. Working Paper No 2, University of Texas Inequality Project (UTIP): 1998.

Galbraith James K., Globalization and Pay, *Proceedings of the American Philosophical Society*, Vol. 143, No. 2 (Jun., 1999), pp. 178-186.

Ocampo, José A., “Entre las Reformas y el Conflicto, Economía y Política en Colombia,” Bogota D.C.: Grupo Editorial Norma (2004).

Bonilla, Ricardo and Jorge Iván González, “Bien-estar y macroeconomía 2002-2006: El Crecimiento Inequitativo no es sostenible,” Colombia: Centro de investigaciones para el desarrollo (CID) and Facultad de Ciencias Económicas (2006).

Robbins, Donald J., “Empleo y Desempleo en Colombia: El impacto de la Legislación Laboral y de las Políticas Salariales,” Bogota D.C.: Documentos de Economía, No. 8, Pontificia Universidad Javeriana. Facultad de Ciencias Económicas y Administrativas: (2003).

Sarmiento, Eduardo, “Alternativas a la encrucijada neoliberal: mercado, narcotráfico y descentralización”, Bogota D.C.: ECOE (1998).

Sarmiento, Eduardo, “El modelo propio: Teorías Económicas e Instrumentos” (Bogota D.C.: Norma-Escuela Colombiana de Ingenieros (2002).

United Nations Conference on Trade and Development (UNCTAD), “Trade and Development Report 2003” in New York: UNCTAD (2003).

United Nations Conference on Trade and Development (UNCTAD), “Trade and Development Report 1999,” New York: UNCTAD (1999).

Tobon, Gilberto “Estado, Política y Economía en Colombia” Bogota D.C. : Señal Editora (2002).

Theil, Henry, “Statistical Decomposition Analysis: With Applications in the Social and Administrative Sciences”, Amsterdam-London: North Holland Publishing Company (1972).

Unión Nacional de Empleados Bancarios (UNEB) “Deuda Publica Territorial, conjura de la banca y el gobierno central contra las regiones” Bogota D.C.: Ediciones UNEB (2005).

Kaplinsky, Raphael “¿Están Cambiando los Términos de Intercambio? ¿China está marcando la diferencia?” Remarks at the VII Conference on Globalization and Development Problems, La Havana, Cuba (2005).

Appendix 1 – Manufacturing Employment Data – Absolute and Relative

	1992		1996		1999		2003		2004	
<i>Low Wage Sectors</i>										
<i>Main Low Wage Sectors</i>										
	<i>Jobs</i>	<i>Share</i>								
Food manufacturing, but not beverages (311-312)	102,999	17.8%	103,528	18.7%	94,486	20.6%	84,599	19.8%	82,663	19.3%
Manufacture of textiles (321)	61,057	10.6%	54,297	9.8%	47,024	10.3%	35,980	8.4%	34,743	8.1%
Manufacture of wearing apparel, excluding footwear (322)	66,229	11.5%	62,276	11.2%	52,095	11.4%	61,303	14.3%	60,735	14.2%
Manufacture of footwear (324)	16,986	2.9%	10,945	2.0%	7,558	1.6%	7,864	1.8%	8,391	2.0%
Manufacture of fabricated metal products (381)	30,415	5.3%	31,963	5.8%	22,733	5.0%	16,239	3.8%	16,115	3.8%
Total, Main Low Wage Sectors	277,686	48.1%	263,009	47.4%	223,896	48.8%	205,985	48.1%	202,647	47.3%
<i>Other Low Wage Sectors</i>										
Leather and products of leather (323)	8,960	1.6%	6,492	1.2%	4,900	1.1%	4,448	1.0%	4,732	1.1%
Wood and wood and cork products (331)	8,019	1.4%	6,893	1.2%	4,807	1.0%	3,743	0.9%	3,866	0.9%
Furniture and fixtures (332)	8,926	1.5%	9,034	1.6%	5,610	1.2%	10,502	2.5%	10,490	2.5%
Plastic products not elsewhere classified (356)	24,700	4.3%	27,184	4.9%	24,597	5.4%	26,152	6.1%	26,098	6.1%
Machinery except electrical (382)	19,138	3.3%	19,047	3.4%	15,354	3.3%	15,547	3.6%	16,141	3.8%
Machinery not Elsewhere (385)	4,282	0.7%	3,656	0.7%	3,183	0.7%	2,277	0.5%	2,284	0.5%
Other Manufacturing Industries (390)	9,596	1.7%	9,476	1.7%	7,375	1.6%	9,123	2.1%	8,517	2.0%
Total, Other Low Wage Sectors	83,621	14.5%	81,782	14.8%	65,826	14.3%	71,792	16.8%	72,128	16.8%
Total, Low Wage Sectors	361,307	62.6%	344,791	62.2%	289,722	63.1%	277,777	64.9%	274,775	64.1%

Source: EAM

Appendix 1 (Continuation) – Manufacturing Employment Data – Absolute and Relative

	1992		1996		1999		2003		2004	
<i>High Wage Sectors</i>										
<i>Main High Wage Sectors</i>	<i>Jobs</i>	<i>Share</i>								
Beverage industries (313)	23,547	4.1%	20,454	3.7%	18,309	4.0%	11044	2.6%	9522	2.2%
Paper and paper products (341)	13,756	2.4%	14,729	2.7%	14,548	3.2%	16657	3.9%	16958	4.0%
Industrial chemicals (351)	15008	2.6%	12478	2.3%	10390	2.3%	6334	1.5%	6390	1.5%
Other chemical products (352)	31,542	5.5%	37,902	6.8%	31,981	7.0%	33392	7.8%	34346	8.0%
Petroleum refineries and Others (353 -354)	7820	1.4%	7549	1.4%	4193	0.9%	3650	0.9%	3611	0.8%
Total, Main High Wage Sectors	91,673	15.9%	93,112	16.8%	79,421	17.3%	71,077	16.6%	70,827	16.5%
<i>Other High Wage Sectors</i>										
Tobacco manufactures (314)	1,937	0.3%	1,220	0.2%	1,106	0.2%	1,107	0.3%	1155	0.3%
Printing, publishing and allied industries (342)	26,774	4.6%	27,930	5.0%	24,095	5.3%	20,020	4.7%	20,257.000	4.7%
Rubber products (355)	7,585	1.3%	6,391	1.2%	5,046	1.1%	3,612	0.8%	3,861.000	0.9%
Pottery and other non metallic products (361-369)	27,024	4.7%	27,636	5.0%	20,268	4.4%	17,641	4.1%	18,268.000	4.3%
Glass and glass products (362)	7,554.000	1.3%	6,600.000	1.2%	4,804.000	1.0%	4,107.000	1.0%	4,234.000	1.0%
Iron and steel basic industries (371)	9870	1.7%	8149	1.5%	7060	1.5%	8251	1.9%	9214	2.2%
Non-ferrous metal basic industries (372)	2497	0.4%	2018	0.4%	1731	0.4%	1494	0.3%	1531	0.4%
Electrical machinery apparatus (372)	19,414	3.4%	18,493	3.3%	11,989	2.6%	11,219	2.6%	11340	2.6%
Transport equipment (384)	22,133	3.8%	17,979	3.2%	13,493	2.9%	11,652	2.7%	12676	3.0%
Total, Other High Wage Sectors	124,788	21.6%	116,416	21.0%	89,592	19.5%	79,103	18.5%	82,536	19.3%
Total High Wage Sectors	216,461	37.5%	209,528	37.8%	169,013	36.8%	150,180	35.1%	153,363	35.8%

Source: EAM

Appendix 2 – Manufacturing Wages Data

	1992	1996	1999	2003	2004
<i>Low Wage Sectors</i>					
<i>Main Low Wage Sectors</i>	Share	Share	Share	Share	Share
Food manufacturing, excluding beverages (311-312)	17.0%	17.6%	19.8%	18.9%	19.0%
Manufacture of textiles (321)	9.1%	8.2%	8.5%	7.6%	7.3%
Manufacture of wearing apparel, excluding footwear (322)	6.7%	6.4%	6.0%	8.1%	8.3%
Manufacture of footwear (324)	1.9%	1.2%	0.9%	1.1%	1.1%
Manufacture of fabricated metal products (381)	4.3%	5.2%	4.3%	3.2%	3.2%
Total, Main Low Wage Sectors	38.9%	38.7%	39.5%	38.9%	38.9%
<i>Other Low Wage Sectors</i>					
Leather and products of leather (323)	1.1%	0.8%	0.7%	0.7%	0.7%
Wood and wood and cork products (331)	1.1%	1.0%	0.8%	0.6%	0.7%
Furniture and fixtures (332)	0.9%	1.0%	0.7%	1.6%	1.6%
Plastic products not elsewhere classified (356)	4.0%	4.7%	5.1%	5.7%	5.8%
Machinery except electrical (382)	2.7%	3.0%	2.8%	3.1%	3.2%
Machinery not Elsewhere (385)	0.8%	0.6%	0.6%	0.4%	0.4%
Other Manufacturing Industries (390)	1.3%	1.4%	1.2%	1.8%	1.8%
Total, Other Low Wage Sectors	11.9%	12.4%	11.9%	14.0%	14.2%
Total Low Wage Sectors	50.8%	51.1%	51.4%	52.9%	53.1%

 Source: EAM

Appendix 2 (Continuation) – Manufacturing Wages Data

	1992	1996	1999	2003	2004
High Wage Sectors					
<i>Main High Wage Sectors</i>					
Beverage industries (313)	5.4%	5.0%	5.7%	3.9%	3.4%
Manufacture of paper and paper products (341)	3.5%	3.9%	4.6%	5.3%	5.2%
Manufacture of industrial chemicals (351)	4.5%	4.0%	4.0%	2.6%	2.6%
Manufacture of other chemical products (352)	8.6%	10.0%	10.3%	12.0%	11.9%
Petroleum refineries (353) and Manufacture of miscellaneous products of petroleum and coal (354)	3.1%	2.7%	1.9%	1.9%	1.7%
Total, High Wage Sectors	25.1%	25.6%	26.4%	25.9%	24.8%
<i>Other High Wage Sectors</i>					
Tobacco manufactures (314)	0.3%	0.2%	0.3%	0.4%	0.4%
Printing, publishing and allied industries (342)	4.3%	5.2%	5.6%	5.1%	5.3%
Rubber products (355)	1.9%	1.5%	1.4%	1.2%	1.3%
Pottery and other non metallic products (361-369)	4.9%	5.1%	4.7%	4.4%	4.4%
Glass and glass products (362)	1.5%	1.4%	1.3%	1.2%	1.2%
Iron and steel basic industries (371)	3.1%	2.0%	2.1%	2.7%	2.8%
Non-ferrous metal basic industries (372)	0.5%	0.4%	0.4%	0.4%	0.4%
Electrical machinery apparatus (372)	3.5%	3.6%	3.0%	2.7%	2.8%
Transport equipment (384)	4.0%	3.8%	3.3%	3.2%	3.4%
Total, Other Wage Sectors	24.1%	23.3%	22.2%	21.3%	22.1%
Total High Wage Sectors	49.2%	48.9%	48.6%	47.1%	46.9%

 Source: EAM
