

MODERNISATION, HETEROGENEITY AND EMPLOYMENT IN MEXICO

In memory of Anibal Pinto

BY Julio López Gallardo

INTRODUCTION

From 1983 onwards, Mexico drastically reformed its economic policies and its institutional set-up. It was expected that these reforms would contribute to the elimination of structural unemployment.

Unfortunately, however, expectations about growth of employment have not been fulfilled. Given its demographic growth rate, Mexico would have had to create around a million new jobs every year in order to sustain its employment rate which is the relative share of employment in the potentially active population. However, during the 1982-1994 period less than two million new positions were created in the formal sector of the economy.

Nevertheless, the fall in the demand for labour did not bring about a considerable increase in the level of open unemployment, which reached its peak in 1983 at 8.2 percent. Apart from that year it has not risen over 6.5 percent¹.

The main objective of this paper is to study the effects of the economic reforms and the ensuing process of the modernisation of firms, on Mexico's labour market, with a special emphasis on their effects on employment and on labour productivity.

The paper is in three sections. In the first section I specify a model to analyse the behaviour of employment in a semi-industrialized economy. In the second section, after describing the evolution of output and employment, I utilize the model to explore the relations between employment, external trade and structural change, and to study the interactions between formal and informal employment and labour productivity. In the last section I discuss some general conclusions that emerge from the study.

ANALYTICAL FRAMEWORK

The model that I will utilize to study the macroeconomics of the labour market has the following distinctive features².

In the first place, I acknowledge that in a semi-industrialised economy in which unemployment benefits are non-existent, only very few people can afford to be completely jobless. The majority of those who do not find employment in the formal sector of the economy thus have to work in the "informal" sector³. I also take into account that the formal sector is heterogeneous in the sense that modern activities in which labour productivity is high, coexist with "backward" activities where labour productivity is very low (Pinto 1965, Cornwall and Cornwall 1994). The formal and informal sectors do not only coexist but they also interact in an unequal manner. On the one hand, I assume that formal output determines informal output; i.e. the latter sector lacks capacity for self-determination and is also incapable to diffuse growth to the rest of the economy. On the other hand, I do not take the labour supply as given but rather assume that it depends on employment in the formal sector.

A second feature of the model is related to the distinction it makes between the different sources of growth of labour productivity, and to the interaction it establishes

between structural change and the evolution of labour productivity. The reader will probably recall that in one of his most remarkable applied works Kaldor (1967) made use of the so-called Verdoorn's Law to show that in a fully specified macro model the rate of growth of labour productivity would be endogenously determined, since it would depend on the rate of growth of the manufacturing sector (see also Thirlwall, 1983). In the present model I take a different route and explore the implications for formal employment of a shock that raises the rate of growth of labour productivity in the tradable goods sector. On the basis of the available evidence I assume that the productivity shock is brought about by the opening-up of the economy.

The final feature of the model is that its macro sector is specified for a small open economy where effective demand directly determines output and employment. The model is based on Michal Kalecki's theory, in which effective demand depends on autonomous expenditure and on profits, and on the share of profits in the value added. Kalecki's theory is particularly apposite for this study because, as will be argued in the text, labour productivity influences both autonomous expenditure and the distribution of income.

In the first part of the model, total employment is distributed between the formal and the "informal" sector. Formal employment by definition depends on formal output and on labour productivity in the formal sector. The rate of increase in formal employment equals this sector's growth rate of output minus the growth rate of labour productivity.

$$L^F = Y^F/A^F \quad (1)$$

$$l^f = y^f - a^f \quad (1')$$

where L^F denotes formal employment, Y^F formal output and A^F average labour productivity in the formal sector, and lower-case letters refer to the growth rate of the respective variables.

Labour supply, on the other hand, depends on the size of the working age population and on the participation ratio. With L_0 being the working age population at the start of the process and r the growth rate of labour supply, this results in:

$$L = L_0 e^{rt} \quad (2)$$

$$r = \phi + \gamma \quad (3)$$

where ϕ is the (exogenously given) demographic growth rate of the population of a working age and γ is the rate of change in the participation ratio.

We can proceed with the hypothesis that the participation ratio depends on the state of the labour market since this association has been found in previous studies for Mexico. Thus Marquez (1980), for example, suggests that in the late seventies the slack labour market discouraged prospective workers, which resulted in a decline in the (male) participation ratio. But the association could also go in the opposite direction since a decline in employment (in combination with falling wages) could force not only the laid off workers but also a section of the previously unemployed population to look for and to accept whichever job might be available. I leave the direction of the association between the participation ratio and the state of the labour market open for the time being and simply postulate:

$$\gamma = \gamma[(L-L^F)/L, (\bullet)] \quad (4)$$

where $(L-L^F)/L$ represents the difference between the supply of labour and the demand for labour in the formal sector as a share of the labour supply, and (\bullet) denotes a series of other factors which are not explicitly considered.

Now, labour market equilibrium requires that the demand for labour in the formal sector equals the labour supply (the first should be larger than the second in case of the existence of initial informal employment). I will now analyse the relationship between labour productivity and employment in the formal sector, average labour productivity, and total employment. Labour productivity in the formal sector will be the main autonomous variable. It should be clear, though, that in this case autonomous does not mean that the growth rate of labour productivity is independent of the growth rate of output. It is a well-known regularity known as "the Verdoorn Law" that the higher the growth rate of output, the higher the growth rate of labour productivity. However, this association is not automatic but rather the consequence of changes that tend to accelerate with a higher growth rate of output. I will now analyse this point.

Average labour productivity in the formal sector A^F depends on three factors. The first is the level of labour productivity in each branch or activity, given the composition of output and the age-structure of the capital equipment. The second is the composition of output (given the other two factors). The third is the age-structure of the capital equipment because new-vintage equipment will normally be more productive. In the first case, the dominant factor is the "technology effect", which I associate with a shift to capital-intensive high-productivity techniques. In the second case the dominant factor is the "composition effect", which I associate with an increase in the share in output of high-productivity branches of production. In the third case the dominant factor is what I call the "renewal-effect", which depends on the share of new investment in output and on the depreciation ratio⁴. Thus:

$$A^F = A^F(H_j^F, U_j^F, N) \quad (5)$$

+ + +

$$a^F = a^F(h_j, u_j, n) \quad (5')$$

+ + +

where H_j refers to the "technology effect", U_j refers to the "composition effect", and N refers to the "renewal effect" (i.e. the share of new-vintage equipment in total equipment). The sign below each variable refers to the sign of the partial derivative regarding the respective variable.

I assume that the informal sector is a shelter for potential wage earners unable to find a position in the formal sector. I will, in order to simplify matters, also assume that no open unemployment exists. I thus posit:

$$L^i = L - L^f \quad (6)$$

Also, labour productivity in informal activities A^i equals the ratio between output Y^i and employment L^i in this sector.

$$A^i = Y^i/L^i \quad (7)$$

$$a^i = y^i - l^i \quad (7')$$

We may further assume that output of the informal sector only depends on output of the formal sector. To simplify I assume a linear relationship:

$$Y^i = b + cY^F, \quad c > 0 \quad (8)$$

Average labour productivity in the overall economy A , on the other hand, depends on labour productivity of the formal and informal sectors A^F and A^i , and on the relative share of each sector in total employment. Thus:

$$A = \lambda A^F + (1-\lambda)A^i \quad (9)$$

where λ is the share of formal employment in total employment.

From the above it follows that average labour productivity (and its growth rate) can be expressed as:

$$A = A(A^F, A^i, L^F) \quad (10)$$

+ +

$$a = a(a^F, a^i, l^F) \quad (10')$$

+ +

While the effect of A^i (a^i) and of L^F (l^F) on A (a) will always be positive, the effect of A^F (a^F) on A (a) is ambiguous. It can be shown that for certain values of variables and parameters of the model, a higher level (growth rate) of labour productivity in the formal sector could reduce the level (growth rate) of labour productivity of both the informal sector and the whole economy. This will in particular be the case when the level (the growth rate) of output in the formal sector Y^F (y^F) is independent of the level (growth rate) of labour productivity in that sector, or when the elasticity of the former with respect to the latter is low⁵.

This last notion brings us to the final section of the model. Following Kalecki (1954) I assume that output in the formal sector depends on gross profits P and on the ratio of profits to output q , where the ratio of profits to output depends on the mark-up over the prime costs k , which is fixed by firms, and on the relation between unit wage costs and prices of basic raw materials j . Profits are determined by private gross investment I , the export surplus E , the budget deficit B , capitalist consumption C_k , and workers savings S_w . The export surplus depends on domestic output, on foreign output Y^* (which I assume to be given), and on competitiveness of domestic production θ . Finally, competitiveness depends on the nominal exchange rate T , on the ratio of productivity of domestic in relation to foreign production (A^F/A^*), on the mark-up, and on set of other factors which I do not model explicitly (•). We thus have:

$$Y^F = P/q \quad (11)$$

$$q = q(k, j) \quad (12)$$

+ +

$$P = I + Ck + E + B - Sw \quad (13)$$

$$E = E(Y^F, Y^*, \theta) \quad (14)$$

$$\theta = \theta [T, (A^F/A^*), k, (\bullet)] \quad (15)$$

The specification for formal output in equations (11)-(15), does not assume that output is always at its full employment level, nor that (potential) supply creates its own demand⁶. In other words, I do not take for granted that a higher level (growth rate) of labour productivity (or a fall in unit labour costs) will necessarily and automatically be matched by a strong enough increase in the effective demand to ensure full employment at a higher level of productivity.

In order to justify this last point, it may be important to bring into light the assumptions required for an increase in labour productivity to induce the rise in demand that is necessary to absorb the additional (potential) supply. These assumptions are usually not spelled out in conventional macroeconomic models and can be analysed with the help of equations (11)-(15).

On the one hand, we can assume that the fall in unit labour costs reduces the mark-up and prices so as to keep constant the ratio of profits to output⁷. Given the nominal exchange rate competitiveness of domestic production rises and this is followed (on the assumption that the Marshall-Lerner condition holds) by an increase in net exports. Investment and capitalist consumption may also rise, and workers savings may decline, due to the influence of the Keynes effect, or the Pigou effect, or both. In any event, profits and output will rise. In fact, they may increase enough to maintain (or raise) employment at the higher level of labour productivity.

Consider now the alternative, and more likely case when prices fall less than unit labour costs because the profit margin, or the relation between unit wage costs and prices of basic raw materials, or both, augment, and consequently the ratio of profits to output rises. Competitiveness improves, though less than in the previous case, and net exports grow. But net exports (or the other components of autonomous expenditure) must now grow more than in the previous case, i.e. enough to compensate for the rise in labour productivity **and** the rise in the ratio of profits to output (see equations 1 and 11).

I shall now employ the model to analyse the evolution of the labour market. I will show that the structural reforms inaugurated in Mexico in the early eighties and the ensuing modernization of firms, accelerated the growth rate of labour productivity in the formal, and especially in the tradable goods sector and, since the growth rate of output did not speed up, they reduced the capacity of the formal sector of the economy to create new jobs. I shall also argue that this reduction went hand in hand with a rise in the participation ratio. I will finally establish that the two processes inflated employment in the informal sector, and that the swelling of employment in the informal sector probably caused a slowing down of the growth rate of labour productivity in this sector and in the whole economy⁸.

MACROECONOMIC EVOLUTION, STRUCTURAL CHANGE AND EMPLOYMENT

Output and Employment: the Evidence

In order to analyse the behaviour of employment on a global scale it seems useful to

start with Table 1 which shows figures for the economy as a whole (for both the formal and informal sector). In the table I single out three stages: 1970-1981, 1982-1994 and 1988-1994. Though the structural reforms began in 1983, they were intensified after 1987. Besides, Mexico suffered two strong external shocks between 1982 and 1986/7, which triggered huge crises. Thus, in order to isolate the impact of the reforms, it is appropriate to concentrate the analysis on the 1988-1994 period during which Mexico achieved a modest rate of economic growth and which is also the period during which the reforms were at their full strength and the country was not affected by external disturbances⁹.

Table 1. Total Economy			
(Growth Rates)			
	1970-81	1982-94	1988-94
Output	6.9%	1.5%	3.9%
Labour productivity	2.7%	0.6%	1.3%
Employment	4.2%	0.9%	2.6%
Source: Author's estimates on the basis of INEGI, National Accounts.			

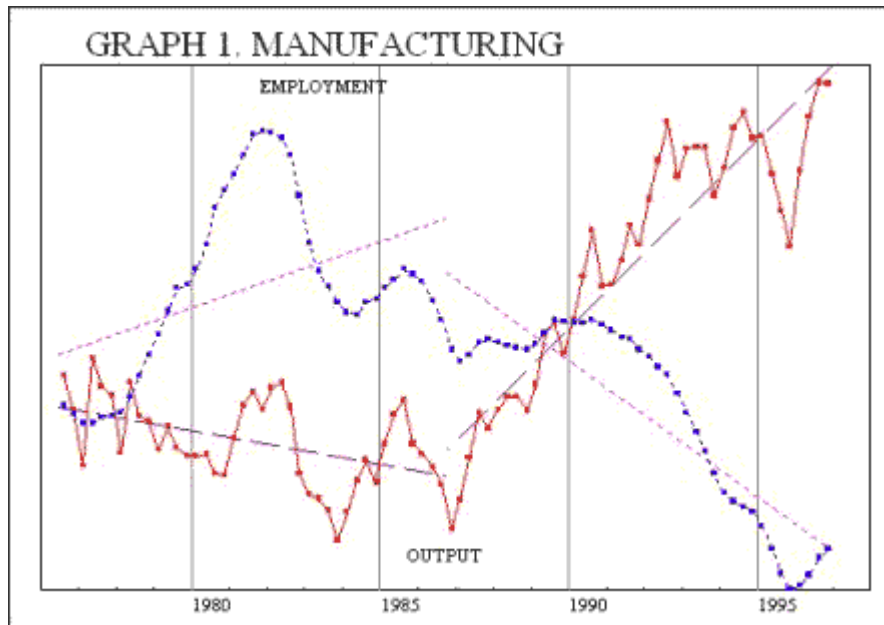
It can be noticed that the trend growth rate of output lost momentum at the beginning of the 1980s. After 1987, when the effects of the negative external shocks had been overcome, the growth rate of output recovered, though not fully. In fact, during the 1988-1994 period it was positive but relatively modest, 3.9 percent annually, and 1.2 percent in per capita terms, which is a figure below the rate that had been achieved previous to the structural reforms. Indeed, between 1954 and 1970, and afterwards between 1970 and 1982, output per capita grew with an annual rate of 3.8 percent and 3.2 percent respectively (See amongst others, Lopez, 1998 and Ros, 1995).

Thus, contrary to what might have been expected from the structural reforms, the objective to increase the growth rate of output was not achieved. This gave rise to a decline in the growth rate of employment.

However, productivity growth fell because the rate of employment declined proportionately less than the growth rate of output. Thus the fall in the pace of the growth of labour productivity partially neutralised the effect of the decrease in the growth rate of output on employment. This might be interpreted in such a way that thanks to the change in the structure of output and the technologies of production, the decrease in the growth rate of labour productivity enabled the formal sector to continue to absorb the labour surplus from the informal sector. However, as presently will be shown, the above interpretation should be rejected.

In order to analyse this last issue I will now consider the evolution of the formal sector of the economy. Time series data for the formal activities as a whole do not exist, but I have constructed an index for employment and output for the manufacturing sector based on the monthly industrial survey which considers only formal establishments (mostly large and medium-sized firms). Though it would be erroneous to assimilate the behaviour of the manufacturing sector with that of the formal sector, the former may be taken as a good proxy for the tradable goods sector, since the bulk of Mexico's exports and imports come from manufacturing.

Graph 1 shows the evolution of the gross value of production and of employment in manufacturing between 1976 and 1996 (in both cases based on a 4-months moving average; notice that the scale of the variables has been adjusted to match means and ranges).



Two features stand out. First of all, it can be seen that at the beginning of the 1980s the loss of momentum in the manufacturing sector brought about a fall in employment. Secondly, we can observe a structural break in the relationship between production and employment. Between 1976 and 1987 employment moved more or less in parallel with production. From then onwards, however, the association between the two was totally lost. While after 1987 and until 1994 output growth recovered its pre-crisis level, the decline in employment continued and even deteriorated, due to an "extra" increase in the growth rate of labour productivity¹⁰.

I carried out an econometric analysis in order to identify the determinants of manufacturing employment, which confirms the above-mentioned structural break. I first estimated a Vector Auto Regression (VAR) with quarterly data for the 1979(1)-1996(4) period, including the following variables: manufacturing employment, manufacturing gross value of production, real average manufacturing wages, real minimum wages, and a dummy variable with a value of 0 until 1986(4) and of 1 from 1987(1) onwards to account for the structural change¹¹. Secondly, since the model was statistically well specified, I could make use of the Johansen (1988) procedure, to identify long-term associations -- i.e. cointegration vectors-- between this set of variables, and I found one or perhaps two cointegration relationships. Thirdly, I applied

restriction variable tests and found that it is a statistically valid restriction to exclude the real minimum and average wage from the first cointegration vector¹². The restricted cointegration vector, which can be taken to be the employment vector, may be expressed as follows:

$$em = 0.33ym - 0.36d$$

where em is the logarithm of manufacturing employment, ym is the logarithm of manufacturing gross value of production and d is the dummy variable which captures the structural change. Thus, between 1979 and 1986, a growth rate of gross value of production of say 10 percent brought about a rise in employment of 3.3 percent. This implies an average rise in labour productivity of 6.7 percent. From 1987 onwards, however, an increase of 10 percent in output would be accompanied by a 0.6 decrease in average employment and an increase in labour productivity of 10.6 percent. Thus the "extra" rate of increase in labour productivity would have been 3.9 percent. The estimated growth rate of labour productivity seems very high, particularly after 1987. The reason for this is that the equation was estimated by using manufacturing gross value of production. Thus a part --it is impossible to know its size-- of what appears as an extra rise in the growth rate of labour productivity is actually due to the decline in the ratio of the value added to the gross value of production due to the rise in the coefficient of import.

To conclude this description of the evolution of labour demand, it may be worth mentioning that the fall in the rate of growth of employment in the formal sector came in tandem with a process of wage differentiation of the working class, whereby wages of highly qualified workers rose while those of unskilled workers strongly declined, together with an increase of the Gini concentration index of income amongst wage earners (see Ruiz 1997; see also Cragg and Epelbaum 1996 and Hanson and Harrison 1999). This development is consistent with the contrasting behaviour of average real manufacturing wages, which increased, and the minimum wage, which dropped. We may conjecture that, given their low initial level and considering the robust growth of labour productivity, manufacturing firms could afford to pay higher wages. The reservation wage of low-skilled workers, on the other hand, probably declined together with the reduction in the real minimum wage (fixed by the government), which led to a fall in their actual wage.

Employment, External Trade and Structural Change

I will now give a possible explanation for the reasons for the acceleration of labour productivity. As a previous step, it should be mentioned that in the mid-eighties Mexico carried out drastic reforms in its trade regime, and in less than five years, i.e. between 1984 and 1987, average import tariffs fell from 41 percent to 14 percent. Also, while in 1982 almost all imports required government authorization, the percentage of imports requiring permit was drastically reduced first in 1985, and then again in 1987, in a downward movement that went ahead until imports requiring permit had fallen to a little more than 10 percent in 1992.

The reforms were followed by a large and steady rise of exports and imports. In 1980 imports plus exports accounted for about 23 percent of gross domestic output (10.7 percent for exports and 12.5 percent for imports), while in 1998 this proportion had increased to over 55 percent (22.5 percent for exports and 22.8 percent for imports). The structure of exports, on the other hand, underwent a radical transformation and

the share of manufacturing in total exports rose from 24.3 percent in 1982 to 85 percent in 1997 (Banco de Mexico 1997).

The opening-up of the economy compelled firms to intensify their efforts for efficiency and competitiveness, and to look for ways in which to speed up the pace of technological development. This is apparent in the case of exporting firms, since the international market is usually very demanding regarding quality, time of delivery, etc. But the greater penetration of and competition from imports also made the internal market much more demanding.

Thus, an important acceleration of the growth rate of fixed investment took place, both on the whole economy and in the manufacturing sector, and probably also in the tradable goods sector as a whole (López, 1998). Simultaneously, Mexican firms intensified their efforts to modernise and rationalise their management methods with better management practices, leaner production, greater quality control, "just-in-time" production, etc. (See Dominguez and Brown 1998, where the results of several plant-level studies are reported).

The rise in the share of investment and the rationalisation and organisational renovation of firms significantly increased labour as well as total factor productivity. I already showed how productivity growth accelerated in manufacturing as a whole, and other studies give more details on the subject. Thus for example Brown and Domínguez, (1998) found that the growth rate of labour productivity accelerated in both export-oriented and domestic-oriented firms, probably encouraged by the higher growth rate of exports in the former and by the penetration of imports in the latter, with exports playing a stimulating role in high-labour-intensity exporting firms in particular¹³.

As was suggested previously, the increase in labour productivity was probably triggered by the acceleration in the "technology effect" and the "renewal effect". Though this conjecture is difficult to test, an approximate estimate of the joint quantitative importance of the two effects can be achieved with the information provided in Table 2, which shows the evolution of labour productivity in the different branches of manufacturing¹⁴.]

TABLE 2

MÉXICO. MANUFACTURING SECTOR RATES OF GROWTH. ANNUAL AVERAGE.	Productivity Productivity	
	1984-87	1988-94
Food, beverage and tobacco	0.94	3.22
Textiles, apparel and leather products I	0.09	4.16
Logging and furniture	0.95	6.10
Paper and printing	5.98	2.67
Chemicals, oil products and plastic	-2.85	5.52
Mineral products	3.12	7.48
Basic metals	2.25	10.12
Machinery and equipment	5.44	6.78

Other manufacturing	-3.96	-1.50
Total	1.75	5.62

Source: Author's estimates on the basis of Brown and Domínguez (1999)

The table confirms that labour productivity growth in manufacturing accelerated in the last period; in 1988-94 it grew three times as fast as in the previous period. More important for the point being discussed, this acceleration took place in all but one of manufacturing branches. This is most likely associated with the "technology" and "renewal" effects, since the "composition" effect probably played a relatively minor role at the level of branches of manufacturing.

As mentioned time and again, the process of modernisation and structural change also modified the configuration of output, increasing the relative share of exports in the gross domestic output. This affected labour absorption through the composition effect.

Indeed, Mexico's manufacturing exports seem to come mostly from high-productivity industries. Thus, it has been found that before the trade reforms the labour intensity of production (estimated on the basis of the input-output matrix) of net-exporter manufacturing industries was lower than in industries with a low volume of trade, or whose trade balance fluctuated between positive and negative values. Moreover, between 1985 and 1990 labour intensity of production fell in all manufacturing industries, but especially so in net-exporter industries and in industries where the rate of growth of exports was above the average (Pérez, 1996).

With the background sketched in this manner, I will now quantify the impact on employment associated with the composition effect on the basis of a very simple exercise. I will estimate what would have been the level of employment if, taking the total level of output and of labour productivity by sector of 1996 as given, the shares of output of 1988 had been maintained¹⁵. In table 3 below I give figures for effective employment and for hypothetical employment --i.e., those that would have existed if the output structure of 1988 and the labour productivity of 1996 had been in force-- for aggregate sectors and for manufacturing branches for 1996.

TABLE 3. ESTIMATING THE LOSS OF EMPLOYMENT

DUE TO CHANGES IN THE STRUCTURE OF OUTPUT (IN THOUSAND OF LABOUR POSTS)	ACTUAL	HYPOTHETICAL EMPLOYMENT	
	EMPLOYMENT 1996	EMPLOYMENT 1996	LOST 1996
TOTAL	28,281.8	30,456.8	2,175.1
AGRICULTURE	6,309.4	6,982.8	673.4
MINING	124.1	139.8	15.7
MANUFACTURING	3,289.9	3,072.3	-217.6
Food, beverage and tobacco	662.1	664.4	2.3
Textiles, apparel and leather products	548.0	540.2	-7.8
Logging and furniture	146.9	181.8	34.9

Paper and printing	170.9	193.1	22.3
Chemicals, oil products and plastic	365.6	360.2	-5.4
Mineral products	146.9	152.5	5.7
Basic metals	55.9	53.7	-2.3
Machinery and equipment	1,068.1	844.8	-223.3
Other manufacturing	125.6	81.6	-44.1
CONSTRUCTION	3,014.1	3,359.8	345.8
ELECTRICITY, GAS AND WATER	151.7	147.1	-4.6
TRADE, RESTAURANTS AND HOTELS	5,190.9	5,561.1	370.3
TRANSPORT AND COMMUNICATION	1,624.7	1,711.9	87.2
FINANCIAL SERVICES	561.6	558.0	-3.5
SOCIAL AND PERSONAL SERVICES	8,015.5	8,923.9	908.4

SOURCE: AUTHOR'S ESTIMATES ON THE BASIS OF NATIONAL ACCOUNTS STATISTICS

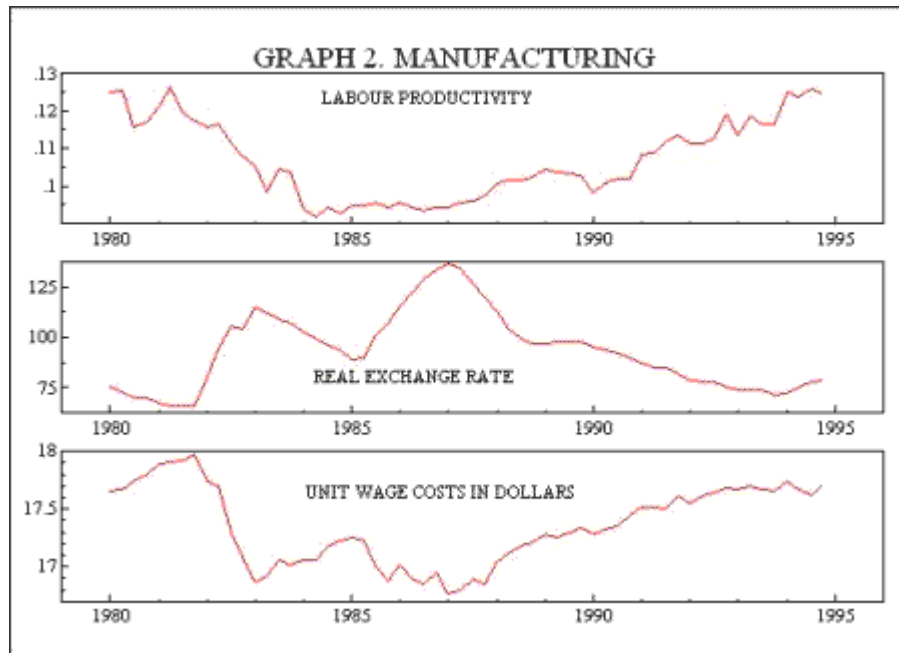
It can be noticed that, if the output structure of 1988 had been maintained, by 1996 some extra 2.2 million work places would have been generated. That is to say, almost 8 percent more than those that were created in fact. The only important sector where the number of effective jobs exceeded the hypothetical jobs was in manufacturing and more specifically in Machinery and equipment. Viewed at from another angle, due to the composition effect labour productivity in 1996 was about 8 percent higher than it would have been otherwise.

We must conclude, then, that the technology effect, the renewal effect and the composition effect, accelerated of the rate of growth of labour productivity, which contributed to reduce labour demand, especially in the tradable goods sector. The other factor slowing down the expansion of labour demand was the modest rate of growth of output. In fact, it is probable that the quantitative importance of the second factor, which affected the whole formal sector, was larger than the quantitative importance of the acceleration of the rate of growth of labour productivity, which affected only the tradable goods sector. I will now propose an explanation for the insufficient growth of output.

Explaining the Low Rate of Growth of Output

A higher growth rate of labour productivity in the formal sector such as experienced by Mexico after the reforms, could have led to an acceleration of the growth rate of output. As I argued, a positive productivity shock may bring about an increase in demand and output, and this increase may be strong enough to offset the fall in labour requirement per unit of output, so as to ensure full employment. But I also claimed that nothing guarantees that the requisite expansion of demand will actually take place.

Why did that rise in output and employment not take place in Mexico's case? Another study would be needed to be able to satisfactorily answer this question, but a clue to the answer can be found in graph 2, which shows the evolution of manufacturing productivity, the real exchange rate, and manufacturing unit labour costs in US dollars (the variables have been seasonally adjusted)¹⁶.



As shown in the graph higher labour productivity was not linked to lower prices in international currency because the peso strongly appreciated (by about 71 percent in real terms between 1987 and 1994). Briefly stated, the appreciation of the peso was the consequence of high liquidity in international financial markets, and of a high-interest-rate monetary policy implemented to fight inflation, which gave rise to large short-term capital inflows (Ibarra, 1999).

The elimination of import controls, the reduction of tariffs, and the depreciation of the foreign exchange, reduced costs and made it possible that exports could keep on growing, but this set of factors produced also a phenomenal boost of imports. Thus, the trade balance worsened, and this was a first factor that prevented demand to expand as required to bring about the requisite increase in output and employment. The second factor that slowed down growth of demand was the fiscal policy stance. Indeed, to confront the deterioration of the trade and current account balance the government followed a restrictive fiscal policy. Thus, the government deficit fell from 5.2 percent of GDP in 1988 to 5.3 percent surplus in 1994. This, however, did not prevent the current account from deteriorating, and the external deficit rose from 1.6 to 7.3 percent of the GDP between 1988 and 1994. The crisis that erupted at the end of 1994 was the outcome of that unsustainable situation.

Formal and informal employment, labour supply and labour productivity

As we have seen, Mexico's ability to create new formal employment dropped after the structural reforms. I will now argue that the stagnation of formal employment stimulated a rise in the participation ratio and boosted employment in the informal sector, and this most probably slowed down the growth rate of labour productivity in the informal sector as well as in the economy as a whole.

As previously mentioned, open employment remained relatively low despite the decrease in the growth rate of formal employment. The participation rate of the population, however, did rise. In fact, and in contrast to previous experiences in

Mexico, the excess in the supply of the demand for labour in the formal sector did not induce a withdrawal of a segment of the population from the labour market.

In this respect Rendón and Salas (1997) found that between 1987 and 1994 the participation rate in the larger cities went up from 50.6 percent to 54.9 percent with an increase of 70.8 to 75.2 percent among men, and of 32.2 to 36.2 percent among women. Thus, the growth rate of the economically active population remained high -- almost 4 percent during the 1980s, and above 3 percent during the 1990s-- despite the decrease in the level of fertility and the fall in the growth rate of the total population.

Concurrently, the number of active workers per household increased (Pliego, 1997, Cortés 1998), which suggest that the population tried to compensate for the fall in individual incomes by increasing the number of income receivers per family, following a strategy that has been named "self-exploitation" of the labour force (Cortés and Rubalcava, 1991).

The disequilibrium between the demand for and supply of labour in the formal sector of the economy also brought about an increase in the growth rate of employment in the informal sector. Thus, for example, (Pliego, 1997:71) concludes that "it can be noticed that the percentage of the working population that undertakes its activities in small establishments or utilising only their vehicles, or does not even have a place to carry out its work, grew from 46.2 to 49.3 percent from 1987 to 1993, while slightly decreasing towards 1994". This author also finds, by taking into account the perceived income as a criteria (and using information from INEGI (various years)), that the working population which could be considered informal (in her evaluation defined as those who earn a salary equal to the minimum wage of 1984 or less) went between 1984 and 1992 from representing 42.7 to 56 percent of the working population¹⁷.

It can be conjectured that productivity, or at least the growth rate of labour productivity in the informal sector, probably fell due to the swelling of employment in that sector. This conjecture is based on the notion that informal output could not grow at the required pace because demand accruing from the formal sector was not rising at a sufficiently high rate. Though the hypothesis of a fall in the level or the rate of growth of productivity in the informal sector is impossible to test, since there are no figures, according to the only available evidence the earnings of informal workers show a clear decline in their income between 1984 and 1994 from 67 percent to 62 percent in relation to the national average (López 1998). In a context in which the growth rate of output and employment in the formal sector was low, the fall in labour productivity in the informal sector is likely to be the cause behind the decline in the growth rate of average labour productivity on the scale of the whole economy.

FINAL CONSIDERATIONS

Mexico's recent experience has a rather wide-ranging interest, because it shows that some of the outcomes expected to result from the set of economic policy measures usually associated with the opening-up of a semi-industrialised economy, do not necessarily materialise.

Apparently, the structural reforms were supposed to stimulate an increase in the trend growth rate of output, together with a rise in the labour intensity of production in the formal sector of the economy. The latter would ensue, first of all, thanks to the rise in the share in output of labour-intensive goods, which are those where Mexico has a

comparative advantage. Also, the fall of wages and the rise in interest rates would stimulate the use of labour-intensive technologies in which the productivity of labour is lower than in capital-intensive technologies.

In fact, economic growth did not accelerate, the pattern of exports did not change in favour of labour-intensive commodities, and low wages do not appear to have encouraged the adoption of labour-intensive production techniques.

The opening-up of the economy did succeed, however, in triggering a positive shock to technical progress and to labour productivity, especially in the tradable goods sector. But speeding up labour productivity did not contribute to accelerating the rate of growth of output so as to stimulate employment. The joint action of market forces and government policy brought about an appreciation of the domestic currency, which deteriorated competitiveness of domestic production and, concurrently with the opening-up to imports, stimulated a worsening of current account balance. The government was thus forced to implement a restrictive fiscal policy stance that hindered growth, but did not prevent the deterioration of the current account that finally led to a crisis.

It would be tempting to conclude this study by asserting that the structural reforms undertaken by Mexico, and especially the opening-up of the economy, were a complete failure, and that the country would have been better off if it had maintained its previous state-led, closed-economy strategy. The present author, however, does not share this point of view. Integration with the world economy may offer enormous benefits for a semi-industrialised economy, but a fruitful integration requires a strategy that is different from the one the Mexican authorities have followed in recent years.

¹ According to the OCDE (1997), if the level of unemployment were adjusted to the standardised definition that is used by this institution, the level of unemployment in Mexico would increase by 1 or 2 percentage points. Thus, whichever measurement scale is used, the rate of open unemployment is relatively small in comparison to that of advanced economies.

² The model is specified rather loosely, because it will be utilized only as a heuristic device to organize the reasoning, and not to investigate its general properties and implications.

³ The concept of the informal sector is a subject of debate. I do not enter that discussion here and I use the term loosely.

⁴ Under steady growth conditions a constant growth rate of labour productivity in **new plants** will be associated with a constant and equivalent growth rate of **average** labour productivity. A shift to high-productivity techniques, or a rise in the rate of investment, or a decline in the average life-span of the capital equipment, will increase the average growth rate of labour productivity. For example, assume an average life-span of capital equipment of 15 years and a 2 percent annual growth rate of labour productivity in new plants. A permanent reduction in the average life-span of the capital equipment from 15 to 12 years will bring about a one-off rise in the average growth rate of labour productivity from 2 to 4.5 percent. A permanent rise in the share of investment in GDP from 5 percent to 8 percent per annum will raise average labour productivity growth from 2 up to 2.11 percent. Finally, a one-off shift to techniques that raise labour productivity in new plants an extra 20 percent, will augment average labour productivity growth from 2 to 3.5 percent. In all of these cases the growth rate of average labour productivity will fall back to its original value, but in the two latter cases this will take place only after the entire capital equipment has been retooled (see Kalecki, 1972).

⁵ The growth rate of average labour productivity will also decline if the elasticity of the participation ratio γ to the $[(L-L^F)/L]$ ratio is positive and high.

⁶ The specification for output in equation (11) could be reformulated in the more usual Keynesian manner, such as, e.g.:

$$Y = (C_0 + I + G + X) / (1 + m + t - c)$$

Where C_0 is the stable part of consumption, I is investment, G government expenditure, X is exports, m is the coefficient of imports, t is the tax rate and c is the propensity to consume.

⁷ Since the rise in labour productivity will reduce labour costs and augment the relation between unit wage costs and prices of basic raw materials j , constancy of the ratio of profits to output q requires a fall of the mark-up over the prime costs k (see equation 12).

⁸ There are no time series data for the informal sector of the economy, and only scarce statistics for a few years. Mexico's National Accounts Systems attempts to capture information for both the formal and informal sectors but without breaking down the figures by sectors. Thus, given the limitations of the information available, a certain measure of speculation cannot be avoided in the following analysis.

⁹ In this table I do not include figures after 1994 for two reasons. First, because Mexico suffered a very serious crisis in 1995 and its inclusion would distort certain aspects of the analysis. Second, because INEGI (Mexico's statistical office) modified some important aspects of the National Accounts methodology after this date. Figures for the same year (1993) based on the two different methodologies show important differences with regard to employment.

¹⁰ The disruption of the association between the gross value of production and employment was also caused by a rise in the manufacturing import coefficient, and the consequent fall in the share of the value added in the gross value of production.

¹¹ Dummy variables for 1980.1 and 1995.1, a constant and one centred seasonal were also included in the model. The econometric estimate was subject to the appropriate misspecification equation and system tests. All the statistical results can be obtained from the author.

¹² Thus, I do not share the view that "One explanation for the absence of large aggregate employment effects was the flexibility demonstrated by real wages" (Revenge, 1995:2). Theoretically, the alleged negative association between wages and employment has not been demonstrated (see Keynes, 1936, and Kalecki 1971). Empirically, wages do not appear as an argument in my estimated long-run employment equation.

¹³ On the other hand, an important change in the composition of labour demand took place. Detailed studies show that in a context of declining labour absorption, employment in fact grew in skill-intensive industries (Hanson and Harrison, 1999), even when the proportion of skilled labour increased in almost all industries (Cragg and Eppelbaum, 1996).

¹⁴ In the table, only firms that reported information in each and every year of the period were considered; i.e. firms that went out of business were eliminated from the sample.

¹⁵ Since the information needed is not available, it has not been possible to estimate the effects of the change in composition ensuing from the change in the relative share of firms of different size on labour productivity and on employment. Brown and Domínguez (1998) found that between 1984 and 1994, 27 per cent of the small, but only 5 per cent of the large firms included in the industrial survey, ceased to report information, probably due to liquidation of the firms. Since labour productivity and its growth rate are lower in small-sized firms, the fall in their relative share in output and in employment probably contributed to raising average labour productivity.

¹⁶ The real exchange rate θ is defined as $T.(p^*/p)$, where T is the nominal exchange rate (pesos per dollar), p^* is the index of foreign prices, and p is the index of domestic prices.

¹⁷ Additional expressions of this tendency towards the swelling of the informal sector are the growing importance in the total number of workers who receive no wages, the relative increase in the amount of people employed who do not receive social security benefits (medical attention, Christmas bonuses and the like), and the increase in the percentage of the population that works independently (Pliego 1997 and Cortés 1998).

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