SOCIAL AND ECONOMIC STUDIES

VOL. 34, NO. 3, SEPTEMBER 1985

ISSN 0037 - 7651

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Social and Economic Studies, Volume 34, No. 3, 1985

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Structural Origins of Mexican Inflation, 1951-1980

ABSTRACT

After a period of over 15 years of relative price stability, the general price level began to rise rapidly in Mexico during the last quarter of 1972, reaching approximately 70 per cent by 1982. The paper addresses itself to three main questions: (i) What role did accelerated government expenditures play in increasing inflationary pressures? (2) To what extent was the recent inflation imported rather than domestically induced? (3) Did the underlying mechanism of inflation change during this period so that the inflation experience in the mid- to late 1970s became fundamentally different from that experienced in prior periods? Taken in their entirety, the empirical results developed in the paper cast doubt on the role of pure cost push factors as a significant contributing factor to Mexico's inflation during the period under consideration. On the other hand, the structuralist interpretation of inflation appears to be on much sounder ground. A number of problems do remain, however, in terms of operationalizing the main arguments of the structuralist thesis for the Mexican context.

INTRODUCTION

After a period of over 15 years of relative price stability, the general price level in Mexico began to rise rapidly in the last quarter of 1972, reaching approximately 30 per cent by 1980. Explanations for the end of price stability are many:

1) the government's inattentiveness to structural problems, permitting them to intensify and finally surface;
2) the government's over-reaction to the economic slowdown of 1971 with vastly expanded monetary and fiscal policies;
3) the effect of world inflation on Mexican prices through more expensive imports, particularly foodstuffs;

4) the government's import substitution policy that encouraged inefficient, high cost production; and
5) the Echeverria administration's attempt at social reform with a high level of economic growth, resulting in large government deficits and severe debt service payments.

A number of other sources are, of course, logically possible [Griffiths 12, p.3] and at least not inconsistent with the country's overall economic patterns of growth and inflation.

Three main questions are addressed. First, what role did accelerated government expenditures play in increasing inflationary pressures? Second, to what extent was the recent inflation imported rather than domestically induced? Finally, did the underlying mechanism of inflation change during this period so that the inflation experience in the mid-1970s was fundamentally different from that in previous periods?

It should be noted that this article does not examine in detail the post-1980 inflation in Mexico. Price increases during the 1980-84 period have been especially severe, reaching nearly 100 per cent per annum in 1982 and 1983. The acceleration in inflation after 1980 is clearly related to oil based expenditures and, therefore, differs somewhat from the 1951-1980 period covered in the analysis presented below. More precisely, in 1979 public investment expanded by 18 per cent in real terms and private investment, partly stimulated by this increase, rose at a similar rate. In 1980, the rates of growth were 17 and 15 per cent respectively. Internal spending, however, increased without generating sufficient domestic savings. As a result, the country currently suffers from a Keynesian inflationary gap [Urquidi 24, p.80]. In addition, the public sector deficit rose to about 16 per cent of GDP in 1982, clearly beyond a reasonable level. Further, during the post-1980 period, some sectors of the Mexican population have been spending at maximum rates. Consumption expenditures as a whole rose at about 5 per cent per year in real terms over the 1980-1983 period.

Those who receive additional income from the oil sector, or other groups enjoying a certain prosperity like the

privileged blue and white collar workers, the professional and technical middle class, the intermediary groups (mainly in wholesale and retail trade) and other high income groups that have benefitted from this whole process, have simply spent more.

The recent inflation has also encouraged anticipatory spending and has discouraged current savings. Through most of 1982 and into 1983, high interest rates from 30 to 40 per cent for bank borrowers have negatively affected small industry and created problems for agriculture and housing. In addition, the high interest rates have tended to fuel the inflationary process, and generated expectations that further accelerated inflation. In short, the acceleration in inflation experienced in the last several years (1980-84) in Mexico should be looked at as a set of oil related, demand forces superimposed on the structural conditions identified in the main body of the article.

RECENT INFLATIONARY PATTERNS

The actual record shows an average rate of real growth per annum in 1973-76 of 4.9 per cent, compared with an average of 6.4 per cent for the preceding six years of stability. The latter included a year (1971) of severe austerity with a low growth rate of 3.4 per cent resulting from a reduction in the rate of public investment by over 23 per cent in its attempt to dampen the rising inflation.

During 1975, the government attempted to deal with inflation again, and it is possible that this was partly responsible for the fall in the rate of growth to 4.1 per cent. In 1977, the additional petroleum and derivatives in GDP increased from 3.6 per cent in 1973 to 5.0 per cent in 1977 and to 6.3 per cent in 1980. From 1977 to date, the new oil resources have added, directly or indirectly, possibly two percentage points to the rate of growth in GDP. Even with this lifting of the trend line, however, the average growth in the first four years of the Lopez Portillo administration was only 6.4 per cent, the same as for 1967-1972 [Bath 5, pp. 198-99].

In terms of overall patterns, prices were clearly more stable in 1960-1970 than in the 1980s. Prices were also more stable relating to international prices and to U.S. prices during the 1960-1970 period.

The conclusion on wages is more difficult to draw. Nominal urban minimum wages grew by 268 per cent between 1970 and 1978, and the increase in real terms was 18.8 per cent deflating by the national consumer price index, and 18.4 per cent deflating by the special consumer price index for low income families. Real wages in manufacturing industry rose by similar amounts.

It should be noted that in periods of high inflation, the annual changes in real wages fluctuate widely. Deflated by the national consumer price index, the real urban minimum (1971-78) shows four annual declines ranging from -0.9 per cent to -66.2 per cent, and four annual increases ranging from 0.9 per cent to 12.7 per cent. In the same period, manufacturing wages were more stable ranging from a decline of -3.1 per cent in 1978 to increases of 0.3 per cent to 9.0 per cent in the other seven years.

Sorting out the relative importance of these and other potential causes of inflation is a difficult task, but a necessary one since: (i) inflationary forces appear to be gathering strength; (ii) the productive expenditure of petroleum earnings will likely fuel excessive demand; and (iii) further spending will run afoul of severe supply inelasticities and/or bottlenecks.

For their part, Mexican authorities appear - after the failures of 1971 and 1975 - unwilling to risk impairing the rate of economic expansion as a means of controlling inflation. President Lopez Portillo has noted on numerous occasions that the government must not reduce inflation by decelerating investment spending or general demand. As late as September 1980 and in the face of 30 per cent inflation, the President outlined various anti-inflationary measures in his Fourth State of the Nation Report, making it clear that any conflicts between inflation and growth would be decided in favour of growth.

It is fair to say, however, that the ability of the Mexican government to come to grips with the nation's recent inflationary build-up will be one of the major factors determining the overall success of its new development programmes and plans.

In this connection, Leopoldo Solis [22] has warned in 1978 that inflation could cause exchange rate problems and thwart import substitution and export development, thereby hampering the goal of product diversification. Others [Bueno 6, Laney 16] have pointed out that Mexico is determined not to repeat the mistakes of Iran and Venezuela. Venezuela has had a reasonably good price stability, but petroleum income has not been used successfully to institute lasting developmental changes in the economy, while Iran encountered high rates of inflation in the 1970s and failed to transform the structure of its internal production.

The nature of the Mexican inflation and the course of inflation related variables therefore merit considerable attention. In the analysis below, particular emphasis is given to inflation in the 1970s, with an attempt made to identify the type and source of the inflation experienced.

THEORIES OF INFLATION

The increase in the rate of inflation in the first half of the 1970s, together with the government's seeming inability to stabilize the price level dramatized the need for a deeper understanding of the country's inflationary process. Something of a debate concerning the precise cause of the rapidly accelerating price level has transpired both within and outside of Mexico. For convenience, two extreme views on the country's inflationary process can be distinguished: the structuralist interpretation and the monetarist explanation.

The Structuralist Position

Structuralism was associated from the beginning with the more leftist writers, together with a number of the leading technocrats in the Ministry of Planning. As developed in Mexico, structuralism seems largely concerned with the examination of potential and actual conflicts between

growth, stabilization and equity - [e.g., Tello 23, C.I.D.E. 7].

Structuralist stress has always been on disequilibrium and the notion that the country's inflation was inevitable once the government attempted rapid growth in the presence of structural bottlenecks or constraints. The chief assumption has been, therefore, that certain fundamental facets of this economic, institutional and socio-political organization of the country in one way or another acted to inhibit economic expansion [Fitzgerald 10, p.238].

One variant of the structuralist school suggests that the rapid industrial growth of the post-war years, far from being stable development, led to greater foreign penetration of the economy – worsening income distribution and sectoral imbalance. These factors not only exacerbated social tensions but also led to a stagnation of the growth process.

Based on this perspective, the Echeverria period is seen largely as one of attempting to get the economy out of this impasse by further state intervention in heavy industry, wage support and agrarian reform. In this, the Echeverria government is felt to have been frustrated by the world crisis of the 1970s and by the opposition of both the domestic and foreign banking system. As Tello notes:

> Critics forget that the deficiencies in economic policy were not in that which was implemented but rather in what was not: the restructuring of the financial, monetary and credit system so that it ceases to be the determinant factor in national economic development [23, p.207].

Historically, the structuralist analysis has been concerned largely with the identification and examination of alleged structural constraints. While not always spelled out, these could be taken to include:

1. the inelastic supply of foodstuffs;
2. the infrastructure bottleneck; and
3. the foreign exchange constraint [Gonzalez and Florescano 11].

In the structuralist view, inflation could not be stopped if these structural limitations were not eliminated. The cumulative inflationary pressures were distortions generated by the

inflationary process itself which were an increasing function of the rate of inflation. The main cumulative factors were:

1. distortions of the price system, mainly caused by the price control policies associated with inflation, and
2. misallocation of resources, mainly investment funds [Mueller 17, pp.150, 153].

Along these lines, many structuralists contend that the country's inflation was inevitable, given the country's phase of transition from an outward oriented export based economy to an inward oriented domestic market based economy. Such a transition, it was argued, required massive changes in the socio-economic structure of the country which the price mechanisms, operating within very imperfect market structures and with limited resource mobility, was unable to achieve-- i.e. given the imperfection of the system, the result of attempting major structural change was simply shortages and disequilibrium on many fronts.

In particular, the employment problem (in Tello and SPF) is seen as clearly determined by the low demand for labour generated by an industry based on foreign technology, while the skewed income distribution produces a demand for luxury products based on this technology [Tello, 23]. Underemployment is seen, therefore, as a more critical problem than inflation [Fitzgerald 10, p.238].

The attention to the composition of demand and the influence of industrial ownership means that this approach can be said to have made the transition from a Keynesian to a Kaleckian view of the world. This is strengthened by the recent detailed empirical attention to the process of price formation through ,markups. on wages and imports by the CIDE group.

Many structuralists see the most serious threat to price stability over the next few years as due to the existence of severe supply bottlenecks. Lagging agricultural production and the short supply of skilled human capital are the two most pressing problems. Alumium, cement, and oil refining capacities are reported to be full. Inadequate transportation and storage facilities may possibly be the most severe bottlenecks.

The railway system still relies heavily on telegraphic communications, employs old locomotives, and must rely on a one track system that limits the number of runs. According to the director of the national railway system, the rail tracks needed to complete rehabilitation will take 18 years and 65 billion pesos at current prices with 23 billion pesos programmed for 1980-1982 to improve them. He indicated that the system is short 150 new diesel-electric locomotives and that 4,000 new cars will be needed each year [Bath 5, p.193].

Inadequate ports and rail transportation have led to an increase in highway use. In late 1979, in Baja California, merchandise was delayed over 60 days because truck operators baulked at the prospect of an empty return run. Trucks waited for a month in Nuevo Laredo for import documents to be processed. At Coatzacoalcos, government agencies and larger companies were paying double or triple the official trucking rates to hire trailers. Such gouging has led some producers such as pharmacuetical companies to withdraw some products from the market. Red tape limits the circulation of trucks to specific areas and means loads have to be switched, adding up to 60 per cent to the cost [Bath 5, p.193].

In this context, the term bottlenecks and the relationship of bottlenecks to inflation must be clarified. Structuralist analysis has often been criticized [Kirkpatrick and Nixson 14, p.132] as unsound because there is no reason, at least in theory, why an increase in the price of one commodity (i.e., a bottleneck) should raise the general price level and provoke an inflationary spiral.

In an open economy, an increase in imports can keep prices constant and in a closed economy, neoclassical theory would predict that a rise in the relative price of one type of good (for example, beans) should lead to a shift in demand to other goods and a reallocation of the factors of production, leading to the restoration of an equilibrium position. But if the prices of manufactured goods are inflexible downwards, a rise in food prices (with other prices constant) raises the average price level. In turn, if industrial wages are tied to consumer prices, they will rise leading to an upward move-

ment in industrial prices. The change in relative prices may be insufficient to lead to a shift in demand and thus an inflationary spiral will develop [Kirkpatrick and Nixson 14, p.132].

The Mexican inflation of the 1970s cannot be explained by structural factors alone. In addition, some sort of propagating mechanism had to be present to sustain price increases over such a long period of time. Here the structuralists are not particularly explicit. Mention is made of a struggle among different economic groups to improve their shares in total income. This manifested itself to a certain extent in conflicts between wage earners and profit earners. Secondly and probably more important, was the struggle between the private and public sectors to increase their share of real resources.

Barkin and Esteva [3, 4] have developed a sociological view along these lines that views the overall price level as determined by the conflict between different social classes over the economic surplus. Successive attempts to maintain or increase wage and profit levels rather than the money supply or growth problems are seen by them as the prime cause of inflation.

This line of argument is relatively novel in the Mexican context, but the author's case seems weakened by their lack of formal specification in their model [Fitzgerald 10, p.240] (particularly the effects of fiscal structures, the stability or otherwise of business markups, and the influence of external price levels).

A further area of sociological contribution to the inflation debate has been in the analysis of entrepreneurial groups. Here some assumption must be made explicitly or implicitly about the strength of domestic industrial capital. The radical writers assume it to be a distorting influence while the more orthodox structuralists argue that capital is incapable of further unaided industrialization. Unfortunately, there has been relatively little empirical research on this topic.

In sum, although a complete structuralist model has not previously been developed for Mexico, one can easily be constructed by incorporating a number of structural elements

into a general Brono-Chenery-Strout model.

As an illustration, a structural inflationary process in the Mexican context could begin with a rapid expansion in economic activity stemming from oil financed government investment in the industrial sector. Such an expansion should cut back under-employment generated over time by the static conditions in the agricultural sector and a moderately high population growth.

In turn, increased incomes create an expanded demand for food, thus generating pressures in the agricultural sector. Due to the low price elasticity of supply in agriculture (a structural problem), however, substantial increases in relative prices in favour of the sector are necessary to clear the market. Food shortages (at relatively stable prices) are aggravated by the fact that oil financed imports were already straining the country's port facilities and transport system. The result: imports of food and consumer products while capable of being financed out of oil revenues, could not increase rapidly enough to augment domestic supplies, thus maintaining a relatively stable price level.

If unemployed resources could have been productively moved to the industrial sector and if industrial prices had been flexible downward, a change in relative prices without inflation might have taken place. However, because of the low mobility of most domestic resources and the inflexibility of industrial prices (due to monopolistic positions encouraged by the import substitution-industrial strategy), monetary expansion was required to generate prices high enough for the change in relative prices.

In short, a structuralist interpretation of Mexico's inflation would contend that domestic price increases stemmed largely from the inability of supply to adapt to a changing and growing level of demand. In the 1970s this problem was characterized by inelasticity and instability in agricultural output together with insufficient infrastructure facilities which precluded imports from aiding in adjustment to equilibrium at relatively stable prices.

With these mechanisms in mind, a structuralist two-gap model [Chenery 9] can be hypothesized for Mexico as

follows. If the Mexican authorities wanted to increase the rate of growth of real gross domestic product from the historic rate of 6 to 7 per cent, the economy would generate a foreign trade gap due to the inelasticity of import demand, a structural problem, together with fixed export revenues. Imports must increase because additional amounts of raw materials and capital goods would be required by the industrial sector. The country's extremely underdeveloped tax system would not be capable of absorbing the excess liquidity from the expanding consumer sector. The result (given the low propensity of most individuals to save) would be a gap between total domestic savings and investment greater than that between exports and imports. In these circumstances, inflation would most likely be the only mechanism capable of facilitating an equilibrium adjustment between the domestic (savings-investment) and external (export-import) gaps; i.e., inflation would result in savings increasing up to the point (through pricing individuals out of certain product markets) where the domestic (savings-investment) gap equalled the external gap.

Structuralists, therefore, view inflation as emerging in the process of making the two gaps equal *ex post.* The actual adjustment process is achieved through two struggles for the available consumer goods: (i) that between wage earners and profit earners, and (ii) that between the private sector and the public sector. The ultimate distribution of income will be determined by the relative strength of these groups.

Using this framework, it is possible to quantify the nature of the overall constraints on the country's growth during the period under consideration.

If imports are now defined to include net factor services, Y or Gross National Product is equal to

(1) $Y = C + I\ (X - M)$ [Landau 15, pp.299-321]

Along with GNP two additional identities can be created:

(2) $Y = C + S$ and

(3) $F + I - S$

and from (1) with Y = GNP:

$F = M - X$

It is now possible to estimate an *ex post* savings function of the form:

$$S + a1 + b1Y + c1F$$

and an *ex post* import function of the form:

$$M = a2 + b2Y = c2F$$

Several possible constraints to the country's growth can now be identified within the context of the so-called two-gap analysis where GS equals the savings gap or (I - S), and GT equals the trade gap or (M - X).

If the trade gap had been a binding constraint on the country's growth during the period under consideration, an *ex ante* deficiency of (desired) foreign exchange would have existed in excess of required investment over potential savings for the level of income existing at the time.

It can be shown that under these circumstances, the estimated coefficient c1 in equation (2) above would assume a value between -1 and 0.

On the other hand, if the savings gap had been binding, foreign capital would have implemented rather than acted as a substitute for domestic savings.

In terms of the equilibrating process, it is unlikely that adjustments reflecting *ex ante* deficiencies in the two gaps would have been alleviated by changes in exports since actual exports could have fallen short of their potential only if:

1) the goods and services exported could have been consumed in significant amounts domestically. There were, of course, limitations on increased domestic oil usage, especially in the short run; and
2) some imports required for producing exports could be employed in the production of goods for the internal market. Here the specialized nature of the oil industry and the limited range of areas to which the factors in this sector could be transferred in the short run precluded this type of adjustment in Mexico during the period under consideration.

The constraints on exports facilitating an equilibrating role meant that increases in imports over their desired level

would have been the likely mechanism of adjustment in those years in which the saving gap was constraining the expansion in income. During those periods, actual and desired levels of savings would be equal, resulting in the estimated value of c1 equalling zero.

Again, the theoretical literature has demonstrated that if in fact imports exceeded their minimum required levels (in the presence of relatively abundant amounts of foreign exchange), estimates of c2 would yield a positive number.

The above considerations can be used to derive a fairly precise method of identifying the nature of the macroeconomic constraints under which the Mexican economy operated during the 1951-82 period as a whole. Tests were also made for several sub-periods to see if there was any shift in the importance of either the domestic or external constraints. As the model is constructed, a value of c1 close to -1.0 together with a value of c2 not significantly different from 0.0 would imply that the trade gap posed the greatest hindrance to increased output.

On the other hand, if estimates of c1 were close to 0.0 and c2 was significantly positive, it is likely the savings gap had been binding.

Finally, if estimates of c1 were significantly negative (but with an absolute value less than unity), while c2 were significantly positive, the country probably experienced periods of alternative savings and trade constraints, with neither dominating the period as a whole.

The results indicate that for the 1962-1980 period as a whole, the trade gap was binding with c1 = 0.35 (Table 1) and c2 small and insignificant. This pattern held fairly steadily during the various sub-periods examined (1952-70; 1952-75; 1966-80; 1961-80).

Apparently, the government's attempts at mobilizing savings were successful in alleviating any constraint from that source. On the other hand, the presence of an over-valued exchange rate together with relatively high rates of income growth through most of the period combined to create a relative shortage of foreign exchange.

COST THEORIES OF INFLATION

The structuralist approach is largely of interest because it provides a useful framework for developing an integrated view of the country's inflationary process. Because it relies on such concepts as relative inelasticity (how inelastic does something have to be before it is relatively inelastic?), the theory is always open to criticism. Several indirect tests as the one above are possible, however, and with time a more complete empirical model will undoubtedly be constructed.

A discussion and quantitative assessment of the importance of cost factors is much more straightforward. It should be noted, however, that any analysis of the cost-push origins of Mexican inflation will suffer from: (i) the limited availability of data, and (ii) the existing data's limitations. There is no consistent time series for wages, nor is there an important price series. Further, the GDP deflator is so weighted by oil that it is of little value in analyzing the possible determinants of domestic price increases. There is a cost of living index and a wholesale price index, but both of these measures are subject to serious defects; i.e., cost of living index is based on a limited sample of goods and services purchased in Mexico City, and is therefore unrepresentative of the consumption patterns of the majority of the rural population, while the wholesale price index is heavily weighted with imports.

Given the available data, two cost factors are examined: (1) world prices, and (2) wages. A structuralist element, the effects of deviations from the trend in real GDP on prices, is also examined.

Movements In World Prices

Given its size, it is safe to assume that Mexico's purchases and sales of non-oil goods in the world market had no effect on the prices of these goods; i.e., for all practical purposes, the prices of the country's non-oil exports and imports were determined by global demand and supply conditions. For purposes of analysis, therefore, the U.S. dollar export and import prices of these goods can be taken as exogenous variables. Given these international prices, the export and im-

port prices in rials were dependent on the peso/dollar rate.

There are two channels by which rising import prices might induce domestic inflation: Firstly, the direct effect transmitted through the higher cost of domestic production of finished products stemming from increases in the prices of imported raw materials. In terms of the second channel, the degree to which producers had little or no way of substituting for imported materials meant that there were few real possibilities (at least in modern industries) of switching from expensive imported goods to cheaper domestic sources of supply.

The data on external sources of inflation for this period are somewhat limited. Nevertheless, several patterns seem fairly clear. A close examination of the actual fluctuations in the rate of inflation in the 1970s suggests a fairly close link between domestic prices and the movement of international prices of food, raw materials, oil, and oil by-products. For example, the 1971-72 decline in the consumer price index appears linked in part to the reduction in international prices of foodstuffs and raw materials taking place at that time.

Similarly, the rise in the rate of inflation in 1973 and 1974 was taking place while the international prices of raw materials and intermediate goods were rising. The sharp increase in public sector prices and tariffs, particularly those on oil and oil by-products, no doubt added to the overall rise in the domestic price level.

Of course, movements in international prices by themselves are not sufficient to explain the rising rate in Mexican inflation relative to those of its major countries. In terms of internal sources of inflationary pressure, both the decline of agricultural production and the slowing down in oil production combined to accentuate the movements in international prices.

Specifically, the rapid rise in the import prices of basic foodstuffs in 1973-74 coincided with a fall in domestic production, thus increasing the import content of agricultural supplies, undermining the effectiveness of the government's agricultural prices policy designed to neutralize the effect

of the imported inflation. The Middle East oil crisis in 1973-74 and the quadrupling of oil prices just happened to occur as the domestic oil industry was beginning to encounter difficulty meeting growing domestic demand.

Also, given available data, it is very difficult to make any clear distinction between external and internal sources of inflationary pressure for intermediate inputs into manufacturing and construction. For sure, there is a relationship between the import price of building materials, the rise in domestic wholesale prices, and the increase in the cost of housing and housing rentals. A similar pattern between import and domestic prices can be observed for textiles. For all of these items, it is apparent that both domestic and foreign sources of price increases contributed to the rise in Mexican wholesale and consumer prices. The domestic component of inflationary pressures corresponded generally in its timing to the expansion of consumer incomes, and for building materials, to the rapid expansion of expenditures in the construction sector.

At the aggregate level, recent empirical work on a large sample of countries suggests that there may be a possible relationship between the degree of national integration into the world economic system and inflation; i.e., in general, the more open countries have experienced less price inflation [Iyoha 13, pp.31-38]. Presumably, openness serves as a kind of safety valve, domestic inflationary pressure spills over into the balance of payments in the open economy thus necessitating less price inflation.

One way of testing for the effect of openness on domestic inflation is to test various formulations of a price equation with measures reflecting the degree of contact with the world economy included as independent variables. Logical candidates in this regard are: (i) the country's import-income ratio; (ii) the rate of change in Mexico's import-income ratio; (iii) the country's terms of trade (the ratio of import prices to export prices); (iv) the rate of growth in the Mexcan money supply; and (v) the rate of growth of Mexico's real gross domestic product.

Iyoha [13, pp.31-38] -- the originator of this test -- used

imports/GDP as an independent variable hypothesizing that a negative correlation between these two variables could be interpreted as evidence that inflationary pressures spill over into balance of payments, thus resulting in less domestic inflation than would have otherwise been the case.

It has been argued [Akhatar 1; Kirkpatrick and Nixson 14] that this mechanism is not a very accurate depiction of the mechanism at work in most developing countries where foreign exchange shortages pose a severe limit to the possibility of absorbing potential inflationary pressures through increasing import surplus. The typical developing country may, therefore, not really have a choice between its rate of domestic inflation and its magnitude of balance of payments deficit; i.e., the rate of inflation may in part be determined by the foreign exchange constraint. Mexico's borrowing capacity in the international financial markets would seem to rule out this problem for most of the period under consideration.

Since there is no real concensus in the literature as to the best way of measuring openness, the simple ratio of nominal imports (in the national income accounts - NAN) to nominal gross domestic product, GDP or K=ZNAN was used.

Another independent variable (suggested by Iyoha [13]) is the terms of trade. Due to lack of import and export unit value figures for Mexico, the terms of trade effect (Q) was defined as the United States export unit value index (International Monetary Fund Financial Statistics) divided by the Mexican wholesale price index (WPI) or Q = USEUV/WPI.

Other independent variables included in the analysis were: (i) the deviation of real GDP from its historical trend (YDT); (ii) the rate of change of the terms of trade (GQ); (iii) the growth in M1 money and M1 lagged (GM1, GM1L); and (iv) expected rate of inflation defined as last year's inflation minus that of the previous year (INFF), with inflation the rate of change in the gross domestic product deflator.

A number of different combinations were tried with

the best results (Table 2) occuring when the various measures of openness were regressed simultaneously with : (i) the growth in the terms of trade (GQ); (ii) the rate of expected inflation (INFE); and (iii) the deviation from the trend (YDT). Regressions on the wholesale price index gave consistently better but quite similar results to those of the consumer price index. Hence, only the results obtained from the regressions with the rate of change in wholesale prices are presented.

The value of K (openness measure) is significant and has the expected negative sign (-1). Caution should be observed in attributing a great deal of significance to the results, however, since the K measure is only slightly significant at the 95 per cent level.

A plausible explanation of the negative relationship between GQ and the rate of inflation is that a substantial portion of imports during this period were required for industrialization; i.e., they did not represent a spillover effect 'proper' from the domestic inflation. This type of import may have increased over time independent of changes in domestic prices. When a capacity constraint (YDT) was added to the regressions to take part of this effect into account, the GQ t value increased significantly. A possible explanation for this result is that on the margin, additional imports did in fact represent spillover imports to an extent great enough to overcome the positive effect of the price inelastic imports.

This issue, while interesting and of some significance for policy design, was not pursued at length simply because several alternative (and somewhat competing) theories of the inflationary process in Mexico were found to be superior from both a statistical and a theoretical point of view.

Wage Increases

A second potential source of cost pressures during this period may have been due to excessive wage increases. Here it is wise to make a distinction between changes in the minimum wage and other wage increases.

The Mexican Constitution itself specifically recognizes the right of workers to receive a sufficient wage to ensure their basic needs and provide their children with the education to which they are entitled. Constitutional Article 123 instituted the country's minimum wage (the lowest amount a worker can be paid for a day's labour).

According to Mario de la Cueva, the idea of the minimum wage is to establish the minimum level in the social scale below which life loses the dignity and essence belonging to the human person. Accordingly, with the aim of guaranteeing full obtainment of the minimum wage, the Constitution provides that such earnings are not liable to discount, embargo or compensation [Schlagheck 20, pp.89-90].

Mexico's minimum wage refers to both general minimum wages and minimum professional wages, applied in skilled trades and fixed according to progress achieved in specific industrial branches – in commerce, professions or special trades and activities. The level set for this second group of wages and salaries is obviously higher than the general minimum wage. Because the cost of living tends to be considerably lower in rural areas than cities, the deputies drafting the Constitution provided that a different scale be established for rural workers.

Minimum wages are fixed by regional commissions made up of labour, management and government representatives and require final approval by the National Minimum Wage Commission (set up along the same lines). Regional commissions are distributed throughout the country by socio-economic zones. Their geographic distribution is based on zones that are supposedly reflective of natural, demographic, social, economic and cultural features, each of which is taken into account in determining the minimum wage for the particular zones.

In 1963 there were 111 zones established for minimum wage enforcement. In September 1974, the National Minimum Wage Commission's Council of Representatives, however, redistributed the zones more in keeping with the economic, demographic, social, political and administrative changes that had taken place in recent years. As a result, the

number of zones fixed for wage setting purposes was cut to 89 (thereby facilitating cost of living studies, family budgeting, and the other indicators periodically established by the National Minimum Wage Commission).

In principle, the minimum wage is established after a consideration of : (i) cost of living measures; (ii) family budgeting (i.e. the aggregate of goods and services that covers the basic material and cultural necessities of a worker and his family); and (iii) an overall assessment of the country's economic conditions, of each zone in particular, of the structure of activities in each, and the behaviour of consumer markets. In conformity with the constitutional guidelines, minimum wages should be remunerative, adequate and fair; consequently, minimum wages and those established in collective contracts were originally revised every two years.

One of the labour reform measures submitted to Congress in September 1974 argued that though the two-year period for wage revision is adequate in times of stability, it is far too long during periods of inflation. At that time, it was argued: (i) that most countries experiencing long periods of economic instability have created mechanisms that permit frequent adjusting of wages to the price level; (ii) that wage increases in times of inflation have acted to maintain both social stability and business growth in a number of countries at a similar stage of development as Mexico; and (iii) that unless wage adjustments are made on an annual basis, there would be a marked inconsistency between the Echeverria administration's wage policy and its policy for the equitable distribution of income progress.

Based on these considerations, the Federal Labour Law was amended on 30 September 1974 with the proviso that minimum wages be fixed annually (starting 1 January of the following year) and that collective contracts would be revised once a year (as of 1 May 1975). All other collective contract clauses were to continue to be renegotiated every two years.

The decree of 24 September 1974 amending the Federal Labour Law empowers workers, labour unions, members of special labour boards, permanent Federal boards of concilia-

tion, local boards of conciliation and labour inspectors to denounce before the competent authorities any employer paying his workers less than the minimum wage or who shows receipts for larger amounts than those actually paid out. The decree established jail sentences of three weeks to two years in all cases and fines up to two thousand pesos when the amount of the default did not exceed one month's minimum wage; five thousand pesos when the minimum has not been paid for two months; and ten thousand pesos when non-fulfillment extends over three months. However, if the employer pays back wages plus interest before the Public Prosecutor has reached a decision, punishment is limited to a fine.

Labour leaders have come to use the minimum wage as a base for collective bargaining demands. In addition, fringe benefits have become more and more liberal, unionized workers have paid holidays, additional obligatory holidays such as May Day, a Christmas bonus of 15 days' pay, profit sharing, social security, housing benefits, and various services like transport to work. Many labour leaders, privately concede, however, that up to 80 per cent of rural workers and 50 per cent of urban workers who should be receiving the minimum wage are not. Employers are easily able to ignore the law of the tremendous demand for jobs which has created a market overwhelmingly in their favour. There is no unemployment insurance in Mexico.

The actual trends in wages are difficult to analyze due to a number of limitations in the underlying data; only approximate estimates are possible. As measured by all wages in a sample of firms, average real wages grew by about 7.5 per cent per year from 1960 through 1964; by about 2.7 per cent per year from 1965 through 1970; and by about 3.6 per cent per year from 1971 through 1976. The annual rate for the period as a whole was about 4.2 per cent.

The real minimum salary which some economists believe to be a more accurate measure of trends in average wages grew slightly faster: 4.9 per cent per year over the period. Increases in fringe benefits further increased the real income of workers in the organized urban sector. Output per worker

in manufacturing grew somewhat faster than wages, at 5 to 7 per cent per year. This productivity growth which is much faster than that observed in most countries may be mostly attributable to the shift to more capital intensive processes in a given sector. This shift is itself a result of the distorted factor prices. A smaller part of the productivity growth is due to a shift towards more capital intensive products. However, this shift has been small.

More of the increase in real wages during 1971-76 occured in 1976. The annual increase had been under 2 per cent through 1975 (as measured by either the average wage in the same firms or average minimum wages); in 1976 the minimum wage rose 13 per cent, while average wages rose about 16 per cent in real terms. (All these estimates are based on annual data, and thus approximate mid-year to mid-year changes.) The December to December increase in 1976 was even greater. From 1972 on, wages in Mexico rose relative to those in the United States, along with the increasing overvaluation of the peso. Devaluation in 1976 brought the relative wage back to the level of the late 1960s. For the 1968-79 period as a whole, real wages in Mexico seem to have risen by far more than in the United States. According to the Bank of Mexico figures [Banco de Mexico 2], the real urban minimum wage in Mexico was 27.1 per cent and the average real manufacturing wage 27.8 per cent above the 1968 level; while in the United States, the average real wage in private non-agricultural industries was 8.7 per cent above that level. According to the monthly data of the General Statistical Department, the Mexican real urban minimum wage was 32.6 per cent on 1 January 1978, and 39.7 per cent on 1 January 1979 - above 1968; while in the United States, real manufacturing wage was on these dates 9.6 and 8.1 per cent respectively - above the same base year.

These comparative data on wages point to an increase in the Mexican cost structure as compared with that of the United States. The effort to keep up the purchasing power of wages appears to have led to excessive increases in money wages for those lucky enough to be employed and especially those protected by the minimum wage law and by the collective wage contracts negotiated by the trade unions.

When the price level is changing so rapidly and relative prices are being distorted by the uneven increases in the prices of individual goods and services, partly the result of the discriminatory system of price control, measurement of the degree to which international competitiveness is being lost becomes very difficult.

It is eary to see, however, that the environment during the 1970s would be conducive to increases in wages and earnings - certainly in nominal terms, and possibly in real terms as well - in certain key sectors where demand was also expanding rapidly. Even though extensive price controls were being introduced by the early 1970s, these were largely applicable to the basic foodstuffs area, and not the more dynamic manufacturing sectors. Hence, one would predict that the most rapid increases in wages and earnings would occur in the sectors and industries in which employment was expanding most rapidly. Similarly, jobs requiring relatively higher levels of skill, given the relative shortage of trained manpower, should also have led to obtaining wage increases. Impressionistic evidence suggests that these were indeed the patterns predominating the country's labour markets where numerous accounts exist attesting to the hindrance to growth posed by shortages of skilled labour.

On the wage side, the seventh day payment, tne 5 per cent INFONAVIT contribution, the vacation bonus, the one per cent education tax, and the 9 to 12 per cent social security tax, the year end bonus, and the 8 per cent of profit sharing levy - all raised the cost of labour by as much as 50 per cent. Moreover, the minimum wage itself tended to increase labour costs above a free market level. For workers earning the minimum salary, these charges were borne completely by the employer (or by his customers if he could pass on the increased costs in the form of higher prices for his products). For workers earning above the minimum salary, however, a part of these charges may have been reflected in lower nominal wages. The result of the increased labour charges and the subsidies to equipment purchasing was that the cost of labour relative to the cost of equipment was perhaps twice what it would be in the absence of these measures.

Since these fringe benefits and the minimum wage were not available to many workers, distortions and inequities must have been created. Migration from rural to urban areas (always sensitive to wage differentials) was undoubtedly increased by the higher wages available in cities. On the other hand, the higher labour costs borne by larger firms which had to pay these fringe benefits may have protected many smaller, informal enterprises (which did not pay them and thus were better able to compete). This last effect may have been important even if the smaller enterprises did not produce the same goods, because higher prices for products from larger enterprises may have shifted consumption to some extent to other products or services that were produced by informal enterprises or by individuals, and therefore had lower unit wage costs.

Despite the increased real wage rates in some areas, it is fairly safe to tentatively conclude that wage cost push pressures did not dominate the inflationary process at this time. Indeed, wage increases contributed to the general rise in production costs. Other costs were rising equally or more rapidly, however. In the context of this period, it is apparent that considerable reserves of unskilled labour existed both in the agricultural sector as urban employment at the beginning of the period. It is hard to see, therefore, how increased labour costs could have been anything but one aspect of the heavy demands increased expenditures placed on all productive resources. There is little evidence to support the singling out of labour as a significant contributor to cost push forces, not least because of the absence of strong labour unions.

In sum, while a case could perhaps be made for the existence of a wage cost push mechanism in the manufacturing and construction sectors, it is difficult to see how as an empirical matter this effect could have dominated the inflationary process in these sectors, let alone the economy as a whole.

Profit Sharing

A variant of the wage cost mechanism is one involving

potential increases in mark-ups due to the country's profit sharing formulas.

The National Commission on Profit Sharing met for the first time in 1963. At that time the Commission ruled that the workers' share of net company profits, less deductions for income tax, "reasonable interest on capital", and "profit reinvestment" was placed at 20 per cent.

Experience in applying these guidelines together with changes taking place in the national economy during this time soon made it clear that a number of revisions in the original profit sharing plan were necessary. Changes in the plan were also indicated in light of the findings of a number of independent studies on the reforms made in fiscal and labour legislation, revealing the urgent need to update the profit sharing system.

Accordingly, a second Commission was created which, on 14 October 1974, placed the workers' share at 8 per cent of the net company profits (before the deductions stipulated in the former decree). The previous arrangement had reduced the share to 6 per cent of profits before income tax payment.

A 1975 amendment to Mexico's labour legislation established federal norms for corporate compliance with the profit sharing obligation. The new law together with Mexico's law defines profits or taxable income in a broad way, excluding only pension fund earnings, dividends received from Mexican companies, and certain gains from the exchange or sale of corporate securities. It is this 8 per cent of all other income that must be shared with employees.

The provision that profit on sharing be determined on the basis of taxable income would seem to facilitate better control over the sums the workers actually receive and enable them to know and exercise the right more directly. Presumably, the new rates are set to leave sufficient margin for profit reinvestment (thereby stimulating the creation of new jobs) while curbing the trend toward intensive use of capital encouraged by the previous system (which allowed larger deductions in sharable profits in proportion to capital intensity).

In fact, the 1974 Commission ruled that the deductions

provided in the previous system for "reasonable interest on capital" and "profit reinvestment" were technically unjustifiable inasmuch as business and industrial enterprises do not earn interest but profits. The position of the Commission appears to reflect the view that company growth rates are not dependent on profit reinvestment (since this type of expansion can be financed through the stock market, the issue of industrial mortgage bonds, and bank credit).

In terms of the division of profits to be shared, the 8 per cent portion of taxable profits is divided and then distributed in two equal parts - i.e., 50 per cent of the 8 per cent lump sum is distributed among employees on the basis of the number of days worked by each during the year. The remaining 50 per cent is distributed according to the salaries earned by each.

To administer the profit sharing process, the government has created a number of boards composed of an equal number of management and labour representatives. These bodies determine the specific profit share of each worker. Any dispute at the board level is referred to the area labour inspector. The final amounts determined by the boards (or inspectors) must be posted at each establishment and subsequently paid to employees no later than 60 days after the date on which annual income tax is due. Workers who object in any way to their allotments can submit a claim to Mexico's income tax authorities for federal review. Seldom, however, is this grievance procedure exercised or redress warranted. Thus, profit sharing is a long and well established practice in Mexico.

It should be noted that the right to share in corporate profits does not entitle workers to intervene in any way in the administration of their companies.

One major criticism of the profit sharing plans centers around the programme's inflationary impact. In fact, local businessmen report that profit sharing results in large periodic lump sum increases in purchasing power which are usually spent on durable goods, appliances, automobiles, homes, etc. This effective demand for goods could presumably be sustained during inflationary periods despite the go-

vernment's efforts to control price increases through tightening consumer credit [Schlagheck 20, pp.94-95].

It would seem, therefore, that profit sharing would, if anything, impact on inflation through some sort of demand pull mechanism rather than through the cost push pressures under consideration here.

DEVIATIONS FROM THE TREND AS A MEASURE OF INFLATIONARY PRESSURE

A proxy measure of the general level of bottlenecks, strains, and ultimately, structural inflationary forces is some measure of the deviation of production from its long run trend. This approach assumes that:

1) short run deviations of output from its long term trend are an adequate measure of the inflationary pressure;

2) the monetary authorities either cannot or do not neutralize the impact of changes in holdings of foreign exchange on the money supply [Otani 14, pp.750-74].

As later analysis will show, the second assumption is open to some question. For now, however, several formulations of the general type:

INFW = YDT + WINF + INFWE + other variables

were estimated. Here, INFW is a measure of domestic inflation (wholesale prices); YDT is a measure of the deviation of real production from its long run trend; WINF is the rate of increase in world prices; and INFWE is a measure of price induced expectations - i.e., the Harber measure of expected inflation as the rate of inflation this year minus the inflation rate last year.

In direct contrast to a quantity of money type price equation (which takes Y as given in the short run), this formulation incorporates a growing body of literature contending that (at least in the short run) the level of real output in developing countries is subject to the influence of domestic policy measures (such as money supply changes) [Sheehey 21, pp.68-79]. Whereas in a quantity of money equation at a given level of income, money supply changes are the measure of excess demand, the above formulation

implies that shifts in money supply will affect prices only if they cause output to rise above its long term trend.

Obviously, the major empirical issue surrounding this approach is the ability of YDT to serve as an effective measure of excess demand. If D does not properly account for this factor, and because the various determinants of inflation tend to some degree to rise together, an undue share of the variation of the prices of home goods may be attributed to import prices and the lagged price changes used in the expectations variable.

With these caveats in mind, a number of regressions of the above general form were run. As with the test of the openness inflation theory, regressions on the rate of increase in the wholesale price index gave somewhat better statistical (but similar) results compared with the consumer price index.

Again, because the literature is not precise as to the best aggregate income measure to use in deviations from the trend analysis, several different income series were tested. A logarithmic form was estimated along with the regular formulation (linear regression of real GDP in time).

Also tested was a measure computed as the difference between the observed growth rate in real GDP and that of the average (8.87) for the 1951-1980 period as a whole (GDT).

The best statistical results were obtained with the measure of the deviation from the trend as that of the linear time trend (YDT). Using this measure, deviations from the trend (1951-1980) together with world inflation (WINF) and the growth in M1 money (equation 9, Table 3), a r^2 of over 0.90 was obtained.

As noted in the discussion of openness and inflation, all measures of openness were quite significant when regressed with YDT. These results are presented in that section.

Again, the rate of world inflation (WINF) is significant when regressed with YDT as is the growth in M2 and M1 measures of money and their lagged values. As in the test for openness, the expected rate of inflation, INFWE, was

significant in each regression tested. Results with the rate of consumer price increases were similar (Table 3), but not as statistically satisfactory.

While these results seem quite satisfactory, several conceptual difficulties detract somewhat from their acceptance.

While these results seem quite satisfactory, several conceptual difficulties detract somewhat from their acceptance as an accurate depiction of the inflationary process in Mexico during this period.

In general, at least three characteristics of the Mexican economy might limit the effectiveness of YDT as a measure of excess demand: (i) the high proportion of agriculture products in both production and consumption; (ii) a fairly high rate of inflation; and (iii) an uneven growth of productive capacity.

Implicit in the use of YDT as a measure of excess demand in the inflation equations is the notion that when the growth of output rose above its long run trend the country's domestic productive capacity was being strained, and that prices had to rise if output was to be increased any further. Clearly, this assumption is predicated on the existence of an upward sloping supply curve of output, whereby increasing prices stimulate further production. This situation is undoubtedly more suited for conditions present in the more advanced economies where gross domestic product has a much higher proportion of industrial products. In general, there should be more scope for expanding the output of manufacturing and services in the short run than would be the case for agricultural products, particularly as in Mexico where most products were subject to a crop cycle or weather conditions. Even though import substitution industrialization was proceeding rapidly, GDP was still heavily concentrated on agricultural products even in the 1970s. Given the rapid expansion in the consumption of food during this period, agriculture's output was probably more subject to fluctuations in domestic supply than in domestic demand. Conceivably, short run deviations of agricultural production above its trend could result in lower rather than higher prices and *vice versa*, thus

distorting the measure of excess demand which the overall deviation from the trend figure was attempting to capture.

A second limitation on the usefulness of YDT as a measure of excess demand is its implicit assumption that productive capacity grows at a fairly constant rate. While investment fluctuates from year to year in most advanced countries, Mexico's investment, particularly private investment, seems to have been especially volatile by any standards.

Whether these fluctuations in capacity are high enough to invalidate the YDT measure of excess demand is difficult to assess. They do, however, cast serious doubts on the procedure.

Finally, applicability of YDT as an accurate measure of demand pressure in Mexico is also questioned because of the country's high rates of inflation and money supply growth, particularly in the 1970s. Within a limited range, changes in short run demand pressure could have resulted partially in higher industrial output and partially in price increases. Nevertheless, a point may have been realized in the early 1970s beyond which an increase in demand resulted in higher prices only. The high rates of money supply growth combined with a high proportion of output in agriculture may have been sufficient to have significantly reduced the economy's short run supply elasticity.

CONCLUSION

Taken in their entirety, the empirical results presented above cast doubt on the role of pure cost push factors as a significant contributing factor to Mexico's inflation during the period under consideration. Admittedly, these may have been present in certain industries and certain times, but their overall impact seems to have been minimal. The structuralist interpretation of inflation would seem to be on much sounder ground. In fact, it might even be argued that in the medium term, the development of industry through the country's import substitution strategy further added to domestic inflationary pressures. High levels of protection afforded new industries from world competitions turned the domestic terms of trade sharply against agriculture in the 1960s

and 1970s, thus reducing the rate of growth of agricultural output below what it would otherwise have been. (The lack of investment in agriculture further exacerbated this problem.)

It is also likely that the industrialization that did take place aggravated or even created a number of rigidities that began to characterize the economy in the 1970s - i.e., the inadequacy of infrastructure created by the sudden demand placed on power and transport by the stepped up level of government expenditures. Similarly, the short term inadequacy of labour - both skilled labour and industrial entrepreneurs - was created by excessive industrial growth.

Ultimately, the issue comes down to the fact that the test outlined above using proxies for structural factors, while statistically satisfactory, suffers from conceptual difficulties. Specifically, many of the underlying assumptions critical for the validity of the deviation from the trend measure may not have been present in Mexico during the period examined. The real issue is whether or not, given the limitations of these theories, the quantity of money (or a version of it) approach – given the availability of direct data for its testing – might not give a better idea of the relative inflationary impact of external *versus* domestic factors.

Monetary elements also warrant more attention simply because in tests with structural factors, the growth in money supply was always statistically significant. The importance of this lies in the fact that in responding to inflation, the government appears to have implicitly accepted the argument that its underlying causes were cost related and not of monetary origins.

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