

Long-Run Changes in the Labour Share of National Income in Canada, 1926-1966

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FOREWORD

The "stability" of the share of national income accruing to labour has been a subject of continuing debate in the economic literature. A number of empirical studies in recent years have indicated a rising labour share. Other studies have argued that if adjustments are made for the earnings of the self-employed and for inter-industry shifts, the labour share will show little, if any, increase.

Against this background, the Centre welcomes Mr. Kumar's analysis of changes in the labour share of national income in Canada for the period 1926-1966. His study makes two particularly significant contributions to our understanding of trends in this area in Canada. First, unincorporated business income is divided into labour income and non-labour income in order to examine the impact of such a division on the stability of the labour share. Secondly, inter-industry shifts in income have been analyzed to see their influence on the secular movement of the labour's share.

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The Director wishes to express his sincere appreciation to Mr. Kumar for preparing this study for publication. It makes a further valuable contribution to our knowledge about this important 'subject in Canada.

W. DONALD WOOD, DIRECTOR
Industrial Relations Centre
Queen's University at Kingston, Ontario
September, 1970

PREFACE

This monograph is a revised version of my dissertation "Variations in the Labour Share of National Income in Canada, 1926-1966" submitted to Queen's University, Kingston, Ontario, in partial fulfilment of the requirements for the degree of Master of Arts in Economics. I am thankful to many people in the University and in the Dominion Bureau of Statistics who willingly and generously provided valuable help in the completion of this study. In particular, I wish to express my sincere appreciation to Professor W. D. Wood and Professor D. C. Smith for their critical comments and suggestions, both in the preparation and the revision of this work.

I am grateful to Mrs. Carol Williams and Mrs. F. Davenport for skilfully editing the study to make it suitable for publication and to the Department of Labour — University Research Committee for providing much-needed financial support.

P. KUMAR
Kingston, Ontario
July, 1970

INTRODUCTION

The stability of the share of national income accruing to labour has long been a "statistical puzzle" in economic research. Although in recent years many empirical studies have revealed a rising share of labour, their conclusions have been disputed on statistical grounds. It has been argued that if adjustments are made for the earnings attributable to labour services of the self-employed and for the inter-industry shifts, the labour share of national income will show very little, if any, increase.

This monograph examines the long run behaviour of the labour share of national income in Canada. The unincorporated business income is divided into labour income and non-labour income, in order to examine the impact of such a division on the stability of the labour share. Since there have been significant inter-industry shifts in Canada over the past four decades, the monograph also analyzes the influence of these shifts on the secular movement of the share of labour in national income.

Stability of the Relative Shares

In the theory of income distribution, the relative shares of national product depend on changes in the techniques of production, in the accumulation of capital relative of labour, in real income per capita, in economic organization and in inter-industry shifts within an economy. Since all, or most, of the factors affecting the movement of relative shares have shown a significant change, the stability of the shares is intriguing. It could be argued that the changes in the techniques of production have been labour saving and that, with the accumulation of capital relative to labour, there have been changes in the quality of productive factors that have kept the relative shares in aggregate output constant. Similarly, the net influence of inter-industry shifts has been negligible on account of the fact that while some industrial sectors have increased their share in total output, the share of other sectors has declined. A comprehensive examination of the factors affecting the behaviour of the labour share of national income has seldom been attempted, and this study does not propose to undertake the task. It does, however, analyze the changes in the share of eleven industrial sectors in business product during the period 1926-1966, with a view to ascertaining the *net* effects of these changes on the aggregate labour share.

Defining Labour Share

An important source of confusion concerning the stability of the labour share relates to the definition of the labour share itself. The labour share is, by definition, a ratio of total labour income and national income. Labour income is the total of all payments to labour as a factor of production and could be defined in many ways. The Canadian national accounts, like the United States accounts, define labour income as the sum of all wages and salaries, supplementary expenditures by employers on labour accounts that can be regarded as payment for an employee's services, e.g., employers' contributions to pension funds, employee welfare funds, unemployment insurance and workmen's compensation. The labour income here does not include compensation for the labour services of the self-employed businessman. This exclusion is a serious gap in the measurement of labour share, since it underestimates the total labour income of those industrial sectors where self-employment is a significant proportion of total industry employment, e.g., agriculture, construction, trade and services. This monograph attempts to fill in this gap by imputing labour income in the self-employed sector.

The national income is the total of all goods and services produced in the country. It could be defined net or gross of capital consumption allowances, on the basis of geographical origin of output or "national" ownership of production, including non-commercial output which is valued differently from the commercial sector. Similarly, national income, for the purpose of factor share analysis, could be defined exclusive of public administration and agriculture, on the grounds that the more than average growth of public administration, where output is measured in terms of employee compensation, and the secular decline in agriculture, might distort the trend in the labour share of national income. This study examines and compares the behaviour of the labour share using various definitions of national income.

The Meaning of Constancy — The Solow Test

What does an economist mean when he says that the labour share has been relatively stable or constant? What is the precise meaning of the constancy of labour share? The term "constancy" does not imply that the share has been absolutely constant but that it has been more nearly constant than one would ordinarily expect. In statistical language, it means that the coefficient of variation —an index of variability- is rather small. Even the coefficient of variation does not tell much unless it is judged against some standard. One such standard has been suggested by Professor R. M. Solow. The standard is based on the fact that the aggregate labour share of national income is a weighted sum of the labour share in the component industrial sectors of the national economy. If the aggregate share is constant and there is no correlation among changes in the weights of the industrial sectors in total output or, if positive and negative correlations offset each other, the variance of the aggregate labour share can be written as:

$$(1) \sigma^2 = \sum_{i=1}^k W_i^2 \sigma_i^2$$

where σ^2 is the variance of aggregate labour share: σ_i^2 is the variance of component industrial sectors and W_i is the weight of the component industrial sectors in total output, or the share of the i th industry output in national product.

If the variance of the labour share in national income, σ^2 , calculated from equation (1), is not significantly different from the actual variance of the aggregate labour share, it could be argued that the aggregate share varied as much as it would if the individual shares fluctuated independently, with positive and negative inter-correlations offsetting each other.

The Dunlop Test

A similar test was used by Professor J. T. Dunlop to investigate the influence of changes in industry weights and industry labour share on the changes in the aggregate labour share, using the identity that aggregate labour share is a weighted sum of the labour share in component industries. It could be written as follows:

$$(2) S = \sum_{i=1}^k W_i S_i$$

Where S = Aggregate labour share
 S_i = Labour share of the i^{th} industry output
 W_i = Weight of the i^{th} industry in total output.

Equation (2) can be written in Δ form as follows:

$$(3) \Delta S = \sum_{i=1}^k \Delta(W_i S_i) = \sum_{i=1}^k (W_i \Delta S_i + S_i \Delta W_i + \Delta W_i \Delta S_i)$$

Equation (3) divides the total change in aggregate labour share in inter-industry weight shifts, changes in the labour share of component industries and changes due to both the weight shifts and industry labour share changes.

This monograph tests the stability of the labour share of national income in Canada for the period 1926-1966, using both the Solow test and the Dunlop test.

Plan of the Study

The first part examines the behaviour of the labour share of national income in Canada over the period 1926-1966. Firstly, the most appropriate national income definition is discussed. The net domestic income — the value of goods and services produced within the geographical boundaries of Canada, irrespective of the ownership of means of production — is considered the most suitable concept for factor share analysis. The reasons for this choice are that this concept is net of capital consumption allowances, which are not strictly factor payments, and free from bias relating to the ownership of productive factors. The basic difference between net domestic product and net national income at factor cost, the definition commonly used, is that while the domestic product includes income paid to non-residents and excludes income received from Canadian nationals abroad, the national product includes incomes of residents abroad and excludes incomes paid to non-residents in Canada. The study outlines the different behaviour of factor shares when using each of the two definitions. The study also examines the movement in the relative shares of national income excluding agriculture, public administration, and non-commercial industries. For the purpose of analysis the period 1926-1966 is subdivided into eight five-yearly terminal periods. The secular change in the labour share is indicated in the study by comparing terminal periods 1926-1930 and 1961-1965. The two periods are roughly comparable in the sense that economic activity and employment were at a high level, except for some minor variations in few individual years: the years 1926-1928 were years of sharp upswings; 1929 was a year of high activity but little growth; 1930 was a year of decided downswing. The year 1961 was also one of slow activity, but the period 1962-1965 represented a period of rapid upswing. The two periods are, however, characterized by slightly different price movements. While 1926-1930 was notable for price stability, 1961-1965 was marked by a mild inflation. In spite of these minor differences the comparison is not likely to be vitiated by cyclical fluctuations in business activity.

The first part also investigates the necessity of dividing unincorporated business income into labour earnings and non-labour earnings. This is highlighted by comparing the behaviour of the labour share in corporate domestic income with that in total domestic income, including both corporate and unincorporated income. The computation of income for the labour services of the self-employed is made separately for agricultural and non-agricultural sectors. Because of lack of data on the number of self-employed, and inadequate information on farm wages, the farm labour income is calculated as a residual. The non-labour, or property, income is computed by imputing an arbitrary rate of return on the current value of farm capital. The value of farm capital, as reported by the decennial censuses of agriculture and the yearly reports of crop correspondents, includes the value of all non-labour inputs, *i.e.*, the value of land and buildings, machinery, implements and livestock. The imputed rate of return is approximated to the average nominal rate of interest on long-term Canadian government bonds: three and a half percent for the years 1926-1928, two percent for the years 1935-1950 and three percent for the years 1950-1966. For the years 1929-1934, no imputation was made. The total net farm income was treated as equal to labour income on the assumption that during these depression years the return on non-labour inputs was zero. This is not an unrealistic assumption since in the non-agricultural sector the corporation profits were at their lowest point; in one or two years they were negative. The rate for the years 1950-1966 was further verified by calculating labour income directly with the help of data on self-employed and farm wages.

The returns to labour in non-farm unincorporated income are calculated on the assumption that the ratio of wages and salaries to total output in the unincorporated sector was similar to the ratio in the corporate sector. This assumption is commonly employed by investigators in this field. The labour earnings are, however, calculated for each year due to the cyclical fluctuations in the share of labour in the unincorporated sector.

The computation of reward for the labour services of the self-employed makes possible the division of total output between payments to labour and payment to capital. This two-fold classification of income between labour income and non-labour, or property income is in line with the theoretical discussion of factor shares based on the aggregate production function approach. This study examines the behaviour of the labour share in the two-fold classification of income and compares it with the behaviour of the share in the threefold classification of national income between labour income, investment income and unincorporated income, and with that in the corporate domestic income. It also analyzes the movements in the labour share using various national income totals.

Finally, the first part analyzes variance of the labour share over the period 1926-1966. The variance of the share in the three-fold division of national income, two-fold division of income and corporate domestic income, is calculated in order to investigate the stability of the share in each of the definitions of national income. The actual variance is compared with the theoretical variance, using the Solow method, to assess whether the stability is real or illusory. The theoretical variance is calculated from equation (1) for the net business product for the period 1926-1966. The weights for the formula are the proportion of each industry's output to net business product in 1949. The net business product rather than net domestic product is used because it excludes non-commercial industries where output is measured in terms of employee compensation. The inclusion of non-commercial industries would have distorted the trend in aggregate labour share.

The theoretical variance is calculated for the labour share of business product both in the three-fold institutional classification of income and for the two-fold classification of income. The two-fold division of income is made by separating the labour earnings of the self-employed from the unincorporated business income. The method of separation has already been discussed above.

The second and last part of the study analyzes the impact of changes in the weights of eleven industrial sectors in business product on the aggregate labour share, using the Dunlop model. The hypothetical inverse relationship between changes in industry weights and changes in industry labour share, as the basis for the stability of the aggregate labour share, is also examined. For the long period, changes over the terminal periods 1926-1930 to 1961-1965 are used to analyze the inter-industry weight shifts. The inverse relationship between changes in industry weight shifts and changes in industry labour share is investigated for the two reference cycle periods, 1929-1933, and 1957-1958. Again, this analysis is undertaken for both the three-fold classification of income and two-fold division of income.

Findings of this Study

The following conclusions have emerged from this study:

- (1) The labour share in the three-fold division of domestic income increased by nearly 18 percent from 1926-1930 to 1961-1965. The exclusion of government, where output is measured in labour services only, did not substantially affect the percentage increase in the labour share of domestic income; the net effect was only a reduction of 3 percentage points, from an 18 percent increase to a 15 percent increase.

The exclusion of the agricultural sector, whose share in total income declined by 65 percent from 1926-1930 to 1961-1965, had a substantial effect on the total percentage increase in the labour share over this period: while the labour share of domestic income (including agriculture) increased by 18 percent from 1926-1930 to 1961-1965, the labour share of non-farm domestic income exhibited only a 9 percent increase. When both the government and agricultural sectors were excluded from domestic income, the labour share showed an increase of only 7 percent. This 7 percent increase represented the increase in employee compensation, including supplementary labour income, as a percentage of non-farm private domestic income. If supplementary labour income were excluded from the labour income, the labour share in non-farm private domestic income (excluding agriculture and government) showed an increase of only 5 percent over the period 1926-1930 to 1961-1965.

PART I: CHANGES IN THE LABOUR SHARE OF NATIONAL INCOME IN CANADA, 1926-1966

Although a considerable body of research exists concerning the behaviour of factor shares in national income, very little work has been done on Canada.¹ In addition, Canadian studies have examined the movements in the relative shares within the framework of national accounts only. No adjustments have been made for the labour services of the self-employed in the net unincorporated income.

This part examines the long-run behaviour of the labour share of national income in Canada for the period 1926-1966, both in the three-fold institutional classification of income used in the Canadian national accounts and in the two-fold functional classification of income between labour income and property income. The functional classification is made by imputing remuneration for the labour services of the self-employed in the unincorporated business.

The Framework

This part analyzes changes in the relative shares of domestic income over the five-yearly terminal periods 1926-1930 to 1961-1965. The shares in domestic product are compared with relative shares in national income at factor cost. Comparison is also made with other national income totals, *i.e.*, Gross Domestic Income (Domestic Income including capital consumption allowances), Private Domestic Income (Domestic Income excluding public administration), Non-Farm Domestic Income (Domestic Income excluding agriculture), Non-Farm Private Domestic Income (Domestic Income excluding both agriculture and public administration), Net Business Product (Domestic Income minus the non-commercial industries) and the Non-Farm Business Product (Business Product excluding agriculture).

It also deals with the labour share of corporate domestic income (domestic income excluding unincorporated business income). The examination of the labour share in corporate domestic income and its comparison with the behaviour of the labour share in total domestic income (when domestic income includes both the corporate and the unincorporated sectors) suggests the need for making adjustment for the labour services of the self-employed in unincorporated business income.

It analyzes the movement in the labour share of domestic income when adjustments are made for the labour income of the self-employed. This adjustment is made separately for the agricultural and the non-agricultural sectors. In the agricultural sector, the labour income is calculated as a residual. The non-labour, or property, income is computed by imputing an arbitrary rate of return on the current value of farm capital. The value of farm capital, as reported by the decennial agriculture census and the yearly reports of crop correspondents, includes the value of all non-labour inputs, *i.e.*, the value of land and buildings, machinery, implements and livestock. The imputed rate of return is approximated to the

¹ The only major study was by S. A. Goldberg and F. H. Leary, "Distribution of Income by Factor Shares in Canada", in *The Behaviour of Income Shares*, Studies in Income and Wealth, XXVII (New York: N.B.E.R., 1964). Other studies on Canada are: J. H. Hotson, "The Constancy of Wage Share: The Canadian Experience", *Review of Economics and Statistics*, LXV (1963) and M. L. Lerohl and G. A. MacEachern, "Factor Shares in Agriculture: The Canada-U.S. Experience", *Canadian Journal of Agricultural Economics*, XV, No. 1 (1967). The study *Output, Labour and Capital in the Canadian Economy* by W. C. Hood and A. Scott, for the Royal Commission on Canada's Economic Prospects (1957) also made estimates of labour share.

average nominal rate of return on long-term government bonds: three and a half percent for the years 1926-1928; two percent for the years 1935-1950, and three percent for the years 1950-1966. For the depression years 1929-1934, all farm income is treated as labour income on the assumption that the return on non-labour inputs was zero. The rate for the years 1950-1966, is verified by calculating labour income directly, with the help of data on the number of self-employed in agriculture and farm wages.

The returns to labour in the non-farm unincorporated income are calculated on the assumption that the ratio of wages and salaries to total output are similar to the ratio in the corporate sector. This assumption is commonly employed by investigators in the field.

The labour share of domestic income in the functional division of income is compared with the labour share of national income and other totals excluding agriculture, public administration and non-commercial industries. The changes in the labour share in the twofold division of income are compared with the labour share in the three-fold institutional division of domestic income and the labour share of corporate domestic income (domestic income excluding unincorporated business income). Such a comparison highlights the necessity of making a functional classification of income between labour income and property income only.

Finally, variances in the labour share of domestic income are shown to see whether the labour share has been stable over the period 1926-1966. The coefficient of variance is used as an index of stability. The actual variance of the business product is compared with the theoretical variance using the Solow test.² The test is made using both the three-fold classification of income and the two-fold functional division of business product.

Factor Shares In the Three-Fold Institutional Division of Domestic Income

The Canadian national accounts divide total domestic income, the value of goods and services produced within the geographical boundaries of Canada, into three broad factor payments: labour income, comprising wages and salaries, supplementary labour income and military pay and allowances; investment income or property income, consisting of corporation profits before taxes, rents, interest and miscellaneous investment income; and entrepreneurial income, the sum of accrued net income of farm operators from farm production, and the net income of non-farm unincorporated businesses. Entrepreneurial income represents the joint earnings of labour and capital of self-employed businessmen. Investment income includes interest and dividends paid to non-residents but excludes payments received from abroad.

Table 1 presents various income shares in domestic income for the five yearly terminal periods 1926-1930 and 1961-1965, and the percentage change in the shares from 1926-1930 to 1961-1965. The table shows that while the labour share and the property share increased over this period, the proportion of entrepreneurial income declined. The percentage decline was considerably larger in the farm sector than in the non-farm unincorporated sector.

² See the Introduction and R. M. Solow, "A skeptical Note on the Constancy of Relative Shares", *American Economic Review*, XLVIII(1958).

Of the 17.8 percent increase in the labour share from 1926-1930 to 1961-1965, 15 percent represents the increase in the share of wages and salaries; the remaining 2.8 percent is accounted for by an upward trend in supplementary labour income. The supplementary labour income as a proportion of domestic income increased by nearly two hundred percent. The increasing trend was particularly marked in the post-war period, 1946-1966, owing to the increasing importance of fringe benefits in union wage demands and the adoption of full employment and social security as an avowed goal of public policy.³

The property share of domestic income (excluding the inventory valuation adjustment) also increased by 12.65 percent from 1926-1930 to 1961-1965. In property or investment income, the corporation profits showed the largest gain. The share of corporation profits in domestic income rose from 9.84 percent in 1926-1930 to 12.67 percent in 1961-1965, an increase of nearly 29 percent. The corporation profits were at their lowest ebb during the depression years 1929-1933, but made a rapid recovery in the late 1930's. The rising trend continued unabated during the war period and reached its peak during the Korean War, when they formed 17.33 percent of total domestic income. The share has been in the range of 11-13 percent since then. The share of rent, interest and miscellaneous investment income, on the other hand, has remained nearly constant. Over the terminal periods 1926-1930 to 1961-1965, it has; in fact, shown a small decline of 4.13 percent. During the war and in most of the post-war period, at least until 1954, the share of this component was below its earlier level. In the mid-1950's, and early 1960's, the share of rents increased considerably on account of high construction activity and a rise in the residential rents, although it was still below its level in the early 1930's and the late 1920's.

The most significant feature of the changes in income distribution in Canada over the last four decades has been the marked decline in the relative importance of unincorporated business income in total domestic output. The entrepreneurial, or unincorporated, income (both farm and non-farm) as a percentage of domestic income declined by 47.5 percent from 1926-1930 to 1961-1965. This declining trend was most noticeable in agriculture. In 1961-1965, agriculture accounted for 4.33 percent of net domestic income compared with 10.96 percent in 1926-1930. Although a comparison of the share of total domestic income originating in agriculture in any two terminal periods may introduce the erratic influence of weather, the decline has, nonetheless, been secular, reflecting the diminishing importance of agriculture in the economic structure of Canada. The decreasing importance of agriculture in domestic output was accompanied by a sharp decline in the agricultural labour force from 1,305 thousand in 1928 to 544 thousand in 1966. About one-third of the labour force was engaged in agriculture in 1926-1930 compared with only 10 percent in 1961-1965. This trend is "associated with the long-term trend toward larger farms, improvements in agricultural technique and the increasing mechanization of farm work, in consequence of which the net output per employed person in agriculture rose very substantially and well in excess of the increase in net output per worker in non-agricultural industries".⁴

³ In absolute terms the supplementary labour income jumped from 698 million dollars in 1941-1945 to 1,272 million dollars in 1946-1950. It stood at 4,579 million in 1961-1965. As a percentage of net domestic product it rose from 1.69 percent in 1941-1945 to 2.10 percent in 1946-1950. It was 2.70 percent of domestic income in 1961-1965.

⁴ *National Income and Expenditure, 1926-1956* (Ottawa: D.B.S., 1958), pp. 11-12. The output per person employed in agriculture increased by 5.6 percent per year over the period 1946-1966, compared with an annual increase of only 2.5 percent in commercial non-agricultural industries. See *Aggregate Productivity Trends, 1946-1966* (Ottawa: D.B.S., 1967).

Similar to the decline in the relative importance of agriculture in total output, the share of non-farm unincorporated income has also shown a secular decline, from 11.74 percent in 1926-1930 to 7.57 percent in 1961-1965. The decline was pronounced during the war and most of the post-war period and has continued since then. The lowest point was reached in the year 1966, when the share of non-farm unincorporated income dropped to 6.71 percent. This trend has been associated with the declining importance of the self-employed in the non-agricultural labour force,⁵ reduced number of unincorporated business establishments⁶ and an increase in the size of business units.⁷ It reflects the growing importance of corporations in Canadian business.

Factor Shares in Various National Income Totals

One of the main sources of confusion in studies of functional distribution of national income is the use of different national income concepts. The use of these totals can be analyzed from two points of view: (1) methodological and (2) pragmatic. Methodologically, three national income concepts are commonly used in relative shares studies: Gross National Product at Market Prices (G.N.P.), National Income at Factor Cost, and Domestic Income or Domestic Product. The G.N.P. is primarily an expenditure concept rather than an income concept. It includes indirect taxes less subsidies and thus complicates income distribution analysis in terms of factor payments, since taxes are not a part of value added. The G.N.P., therefore, is not considered suitable for an examination of relative shares.⁸ The national income at factor cost is an institutional concept. It represents the value of goods and services produced by Canadian *nationals*, the domestic income is a purely technical concept. It is the total value of output produced within the geographical boundaries of Canada, irrespective of the ownership of means of production. The basic distinction between domestic income and national income is that, while the domestic income includes income paid to non-residents and excludes income received from Canadian nationals abroad, the national income includes incomes of Canadians abroad and excludes incomes paid to foreign nationals in Canada. Such a distinction is important in the Canadian case, since a large part of Canadian industry is controlled by non-residents.⁹ The domestic income concept is, therefore, preferred in the analysis of factor shares.

⁵ The percentage of self-employed in the non-agricultural labour force declined from 19.70 percent in 1931-1935 to 10.28 percent in 1961-1965.

⁶ In 1964, 31 percent of the total manufacturing establishments were unincorporated (owned by working proprietors), compared with 47.3 percent in 1946. The percentage of corporate establishments, on the other hand, increased from 33.4 in 1946 to 58.7 percent in 1964.

⁷ Although the data on the size of business establishments is scanty, certain significant conclusions can be drawn from the size distribution of business units in the manufacturing sector. In 1923 establishments employing 500 or more employees accounted for 21.4 percent of the total number of employees in this sector. By 1929, this percentage had increased to 27.3 and stood at 35.3 in 1964, reflecting increasing concentration of production into larger units. The establishments with less than 5 employees accounted for 4.38 percent of total employees in manufacturing in 1929. The percentage dropped to 1.8 in 1964. See *The Canada Year Book*, 1936 and 1969 (Ottawa: D.B.S.).

⁸ See J. W. Kendrick, *Productivity Trends in the United States* (Princeton: Princeton University Press, 1961), pp. 22-28.

⁹ In 1966, 22.4 percent of total corporations in Canada had foreign interests. The non-resident ownership controlled 63.9 percent of total corporation assets and 79.1 percent of total corporation equity. The foreign-owned corporations accounted for 82.5 percent of all sales by corporations and received 80.8 percent of total corporation profits, *Annual Report Under the Corporations and Labour Unions Returns Act for 1966* (Ottawa D.B.S., 1969), pp. 115-118.

Table 1 - CHANGES IN FACTOR SHARES OF DOMESTIC INCOME*

Shares	1926-30	1961-65	Point Change col. (2)-col. (1)	Percentage Change col. (3) as a percentage of col. (1)
	(1)	(2)	(3)	(4)
1) Labour Share:	56.73	66.82	+10.09	+17.78
a) Wages and Salaries incl. military allowances	55.84	64.20	+8.36	+14.96
b) Supplementary labour income	.89	2.62	+1.73	+194.38
2) Property Share:	19.28	21.72	+2.44	+12.65
a) Corporation profits	9.84	12.67	+2.83	+28.76
b) Rent, interest & misc. investment income	9.44	9.05	-.39	-4.13
3) Entrepreneurial income	22.70	11.90	-10.80	-47.57
a) Net farm income	10.96	4.33	-6.63	-60.49
b) Net unincorporated non-farm income	11.74	7.57	-4.17	-35.51

Source: *National Accounts* (Ottawa: **D.B.S.**).

*Factor shares do not total 100.00 percent due to Inventory Valuation Adjustment (I.V.A.). The I.V.A. was 1.29 percent and -0.44 percent of domestic income in terminal periods 1926-1930 and 1961-1965 respectively.

Another important methodological problem relates to the use of the gross or net concepts of domestic income. The difference between the two is capital consumption allowances: while the gross domestic income includes capital consumption allowances, the net domestic income does not. If the capital consumption allowances are treated as a part of the return to capital, the use of the gross domestic income concept may be justified. Most researchers would, however, be inclined to exclude them from payments to the services of capital input, since they represent compensation for the "wear and tear" of machinery and equipment and are not affected by market conditions of supply and demand for capital.

Table 2 presents various factor shares in the three national income totals, net national income, net domestic income and gross domestic income, for five-yearly terminal periods, and shows the percentage change in the shares over the periods 1926-1930 to 1961-1965.

National Income v. Domestic Income

The table shows that the labour share of national income increased by 14 percent from 1926-1930 to 1961-1965 and the property share by 21 percent. The labour share and the property share of domestic income went up by 18 percent and 3 percent respectively over the same period. While the use of the domestic, rather than the national, income concept makes little difference to the behaviour of the labour share, the magnitude of change in the property share in the two income totals differs considerably. In addition, the property share of national income is smaller than the property share of domestic income. The differential behaviour is on account of the fact that in the Canadian national accounts, the non-resident income consists entirely of interests and dividends: it does not include the labour income of non-residents because of the non-availability of data. The statistical authorities feel that the labour income is a very small, virtually negligible, portion of the total income of non-residents. Furthermore, the share of non-residents in total investment income has declined from 31.78 percent in 1926-1930 to 11.00 percent in 1961-1965. The decline was marked during the war and post-war period after the non-residents' income reached its peak in 1931-1935, when their share in investment income went up to 53.27 percent.

Net v. Gross Domestic Income

In the use of gross domestic income again, the property share has behaved differently from the property share of net domestic income. Although the share of investment income or property income in gross domestic output has increased by 10.95 percent over the terminal periods 1926-1930 to 1961-1965, compared with an increase of only 3.45 percent in the investment income share of net domestic income over the same period, it has been quite stable: the year to year fluctuations, due to business cycles, have not been as marked as they have been in the property share of domestic income. This cyclical insensitivity of the property share of gross domestic income is explained by the fact that the capital consumption allowances are a fixed charge to businesses. The inclusion of capital consumption allowances, in the factor shares analysis, therefore, distorts the behaviour of the property share in national income.

Table 2 - FACTOR SHARES IN NATIONAL INCOME AND DOMESTIC INCOME

Factor Shares	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55	1956-60	1961-65	Percent Change from 1926-30 to 1961-65
				Net National Income					
1. Labour Share	59.78	71.67	63.76	63.26	62.19	64.31	67.76	68.14	+13.98
2. Property Share*	16.29	11.93	16.85	18.09	16.68	18.75	19.17	19.72	+21.06
3. Share of Unincorporated Income	23.93	16.40	19.39	18.65	21.13	16.94	13.07	12.14	-49.26
				Net Domestic Income					
1. Labour Share	56.73	66.15	60.21	61.81	60.69	63.31	66.84	66.82	+17.78
2. Property Share*	20.57	18.72	21.48	19.97	18.69	20.01	20.27	21.28	+3.45
3. Share of Unincorporated Income	22.70	15.13	18.31	18.22	20.62	16.68	12.89	11.90	-47.57
				Gross Domestic Income					
1. Labour Share	49.79	56.00	52.61	55.50	54.19	55.50	57.54	57.86	+16.20
2. Property Share*	2.48	23.91	25.81	24.35	23.21	24.80	26.46	27.16	+10.95
3. Share of Unincorporated Income	25.73	20.09	21.58	23.21	22.60	19.70	16.00	14.98	-41.78

*Includes Inventory Valuation Adjustment

SOURCE: *National Accounts*, D.B.S., Ottawa.

Table 3 - FACTOR SHARES IN DOMESTIC INCOME, EXCLUDING AGRICULTURE, PUBLIC ADMINISTRATION AND NON-COMMERCIAL SECTORS

Factor Shares *	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55	1956-60	1961-65	Percent Change from 1926-30 to 1961-65
		Domestic Income							
1. Labour Share	56.73	66.15	60.21	61.81	60.69	63.31	66.84	66.82	+17.78
2. Property Share*	20.57	18.72	21.48	19.97	18.69	20.01	20.27	21.28	+3.45
3. Entrepreneurial Share	22.70	15.13	18.31	18.22	20.62	16.68	12.89	11.90	-47.57
		Private Domestic Income							
1. Labour Share	54.00	62.67	56.02	55.20	57.45	59.72	62.77	62.09	+14.98
2. Property Share*	21.87	20.64	23.97	23.42	20.23	21.97	22.75	24.36	+11.39
3. Entrepreneurial Share	13.80	11.97	11.88	9.87	11.85	9.45	8.69	7.98	-42.17
		Non-Farm Domestic Income							
1. Labour Share	63.92	70.09	65.46	68.23	67.36	68.76	70.05	69.83	+9.24
2. Property Share*	22.28	17.94	22.66	21.90	20.79	21.79	21.26	22.19	-0.40
3. Entrepreneurial Share	14.83	13.33	13.13	11.83	12.97	10.48	9.82	9.16	-38.23
		Non-Farm Private Domestic Income							
1. Labour Share	61.22	66.69	61.83	61.90	64.28	65.38	66.13	65.39	+6.81
2. Property Share*	23.95	19.98	25.04	26.27	22.75	24.14	24.05	25.45	+6.26
3. Entrepreneurial Share	14.83	13.33	13.13	11.83	12.97	10.48	9.82	9.16	-38.23
		Net Business Product							
1. Labour Share	52.33	60.92	55.01	54.35	56.57	58.33	61.43	40.78	+16.14
2. Property Share*	22.66	21.61	24.29	23.86	20.65	22.93	23.74	25.12	+10.86
3. Entrepreneurial Share	25.01	17.47	20.70	21.79	22.78	18.74	14.83	14.10	-43.62
		Non-Farm Business Product							
1. Labour Share	59.55	64.96	60.32	61.16	63.43	64.36	64.84	64.12	+7.67
2. Property Share*	24.97	21.01	26.03	26.73	23.30	24.90	25.07	26.31	+5.37
3. Entrepreneurial Share	15.48	14.03	13.65	12.11	13.27	10.74	10.09	9.57	-38.17

*Includes inventory valuation adjustment

Source: *National Accounts*, D.B.S., Ottawa.

The Pragmatic View: Exclusion of Agriculture, Public Administration and Non-Commercial Industries

Many researchers have calculated factor shares in national income excluding agriculture, or public administration or noncommercial industries or all three. The rationale behind these exclusions is that the growth of these industries has been disproportionate compared to other industries. In addition, the output of public administration and other non-commercial industries is measured in terms of employee compensation. Their inclusion, therefore, might distort the trend behaviour of the labour share in national income. The relative importance of agriculture, for example, has declined considerably over the past four decades due to structural changes within the Canadian economy. The weight of public administration in total output has shown a rapid increase because of the increasing role of the government in economic activity and the consequent expansion of government services.¹⁰

Table 3 gives relative shares of various domestic income totals excluding agriculture, public administration and non-commercial services for the five terminal periods from 1926 to 1966. The domestic income excluding government sector is designated private domestic income, domestic income excluding agriculture as non-farm domestic income, domestic income excluding both the government and agriculture as non-farm private domestic income. The net business product is the sum of incomes originating in commercial sectors of the economy. It differs from domestic income in that it excludes government and personal non-commercial services. The non-farm business product is simply the business product excluding agriculture.

The table shows that the exclusion of government from domestic income does not materially affect the secular behaviour of the labour share. The labour share of private domestic income (domestic income excluding government) from 1926-1930 to 1961-1965 increased by 14.98 percent compared with an increase of 17.78 percent in the labour share of domestic income over the same period. The exclusion does add 8 percentage points to the increase in the property share of domestic income. This is due to the measurement of government output in terms of labour compensation only. The percentage increase in the labour share, however, over the terminal periods 1926-1930 to 1961-1965, is reduced to nearly half when agriculture is excluded from the income totals: the labour share of non-farm domestic income increased by only 9.24 percent compared with an increase of 17.78 percent in the labour share of domestic income. This appears to be on account of secularly declining trend in the relative importance of agriculture. When both government and agriculture sectors are excluded from the totals, the labour share shows an increase of only 6.81 percent over the period 1926-1930 to 1961-1965, compared with an increase of 17.78 percent in the labour share of domestic income.

The exclusion of non-commercial industries (including the government non-commercial services) affects the percentage increase in the labour share only by one and a half percent. The labour share of net business product (domestic income excluding all private and public non-commercial services) shows an increase of 16.14 percent over the period 1926-1930 to 1961-1965, compared with a 17.78 percent

¹⁰ The public administration (which includes Canadian Broadcasting Corporation and some municipal services but excludes commercial government enterprise) accounted for 12.6 percent of domestic income in 1961, compared with 5.9 percent in 1926-30. The average annual rate of growth of public administration in 1926-66 has been 7.7 percent compared with 5.6 percent growth rate of private domestic income (domestic income excluding public administration).

increase in the labour share of domestic product. When all three sectors, *i.e.*, agriculture, government and non-commercial services are excluded from domestic income, the labour share shows an increase of 7.67 percent.¹¹

The Labour Share in the Three-Fold Institutional Division of Domestic Income: Summary

An examination of factor shares of domestic income in the preceding pages showed that the labour share of domestic income increased by 17.78 percent from 1926-1930 to 1961-1965. The share of investment income also increased by 12.65 percent. The most significant feature of income distribution within the framework of national accounts, however, has been a marked decline in unincorporated income, particularly in the agricultural sector. The decline in the relative importance of agriculture has been accompanied by a manpower shift from agriculture to industry. The secular decline in non-farm unincorporated income reflects changes in the structure of business organization in Canada. The increasing size of business units, the growing number and proportion of corporate establishments, the decline in the number of self-employed workers were some of the structural changes noted.

It was pointed out that the use of various national income totals for function income distribution analysis can be analyzed from two points of view: methodological and pragmatical. Methodologically, the domestic income concept was preferred to the national income concept and the gross domestic income concept. The use of the national, instead of the domestic income total influenced the behaviour of investment income share and concealed changes in the proportion of non-residents' income. The choice of gross domestic income total rather than domestic income led to the cyclical insensitivity of the property share due to the inclusion of capital consumption allowances which are a fixed charge to business and represent compensation for the "wear and tear" of capital equipment rather than a factor payment.

Labour Share in the Two-Fold Functional Division of Income

The analysis of factor shares in the framework of Canadian national accounts is theoretically inconsistent and methodically objectionable on the grounds that it treats unincorporated business income as a factor income, separate from labour income and investment income. The unincorporated income is a joint income of labour input and capital input of the self-employed. The calculation of labour share with unincorporated income in the denominator is, therefore, inconsistent. It is likely that the sharp reduction in the relative importance of income originating in agriculture and the declining importance of the unincorporated form of business organization, during the past four decades, has contributed to the apparent rise in the labour share of national income. The examination of the labour share in the non-farm domestic income in the preceding pages, indicated that the percentage increase in the share from 1926-1930 to 1961-1965, was reduced to nearly half when agriculture was excluded from the domestic income totals. The influence of unincorporated income on the behaviour of the labour share is further confirmed in the examination of relative shares of corporate domestic income (domestic income excluding both farm and non-farm unincorporated income).

¹¹ Our results are similar to the findings of S. A. Goldberg for the period of 1926-30 to 1954-58. See "Distribution of income..." pp. 220-225. Goldberg found that when agriculture was excluded from the income totals, the percentage increase in the labour share was reduced by about 7 percentage points.

Labour Share in Corporate Domestic Income

Table 4 presents the relative shares of corporate domestic income in the five-year period from 1926-1930 to 1961-1965. The table also shows changes in the labour share, profit share and the rental share over the two terminal periods. It shows that while the labour share of corporate domestic income increased by 2.92 percent from 1926-1930 to 1961-1965, the profit share rose by 12.87 percent and the rental share declined by 29.51 percent.

An increase of 2.92 percent in the labour share of corporate domestic income is quite small compared with an increase of 17.78 percent in the labour share of domestic income (including unincorporated business income). This adds weight to the argument that the increase in the labour share has been overestimated on account of the declining importance of unincorporated form of business organization. Even within the incorporated establishments there appears to be an inverse relationship between the labour share and the size of establishment.¹²

Splitting Unincorporated Income

The comparative examination of factor shares in total domestic income and corporate domestic income suggests that the split of unincorporated income between labour income and investment income was a basic prerequisite for a proper analysis of the functional distribution of income. A functional distribution of national income, based on the reward for the functions performed by the two factors of production, labour and capital, would provide a consistent view of the changes in relative shares of national income. Since national accounts are not organized on a functional basis, conversion of the institutional division into a functional division of income would involve separating out the earnings of labour and capital in self-employed income.¹³ Many authors have been hesitant to undertake such a split not only because the desirable procedure for carrying out the segregation is complex, but also because the necessary data are not readily available. In the absence of adequate information, the calculations of labour income in unincorporated income are made on simplifying assumptions.¹⁴ One common assumption underlying the split has been that the ratio of wages and salaries to total output in the unincorporated sector would be identical to the ratio in the corporate sector.¹⁵

We have undertaken this, with hesitation and on the risk of arbitrary judgement, in the hope that this would provide a start and thus stimulate the collection of proper data in Canada for such an analysis. In this study, labour income has been calculated separately for agricultural and non-agricultural

¹² S. A. Goldberg, pp. 233-234.

¹³ There is a feeling that the functional division of income, by adding the split amounts of unincorporated income to labour income and investment income, would be produced with the disturbing effects of shifts between forms of business organization removed from the data. See S. A. Goldberg, p. 224.

¹⁴ Goldberg feels that a "realistic apportionment of net unincorporated income between capital and labour should be calculated separately for each industry, by size groups, by forms of ownership of premises and on the basis of a changing, not constant, ratio". Furthermore, ". . . appeal would have to be made to statistical data reflecting, in many ways, substantially different market situations, such as those pertaining to the corporate sector and the regular labour market". S. A. Goldberg, p. 225.

¹⁵ This might not be very realistic on an aggregative basis because the ratio of labour income to total unincorporated income varies substantially between industries, from instances where almost the entire income could properly be allocated to labour, to cases where a very high proportion may be attributable to capital.

unincorporated sectors. In the non-farm unincorporated sector, the split between labour income and investment income was made on the assumption that the ratio of labour income to total income in the unincorporated business income was identical to the ratio in the corporate business income. The share of labour in corporate domestic income was applied to the unincorporated income to obtain the split. In agriculture, investment income was calculated directly by imputing an average nominal rate of return on the current value of farm capital. The data on the total value of farm capital are published in the *Quarterly Bulletin of Agricultural Statistics* (D.B.S.) and are based on the decennial agricultural census and the yearly reports of crop correspondents. They represent the total value of land and buildings, implements, machinery and livestock including poultry and animals on farms. The rate of return on farm capital was approximated to the behaviour of the long term rate of interest in Canada.¹⁶ The labour income was calculated as a residual. The residual labour income in agriculture for the period 1950-1966 was verified by calculating labour income directly with the help of data on the number of self-employed on farms, on the assumption that the farmer and his unpaid family would get the same wage, if they were not self-employed, as that paid to the hired farm worker. The split amounts were added to corporate labour income and investment income to produce a consolidated dual functional classification of domestic income. The share of imputed farm and non-farm labour income in total domestic income was also calculated to highlight the movement in the aggregate share compared with the labour share of paid employees in domestic income.

Factor Shares in Consolidated Dual Classification of Domestic Income

The relative shares of domestic income in consolidated dual functional classification of income are shown in Table 5 for the five-yearly terminal periods from 1926-1930 to 1961-1965. The table gives separately the share of paid employees (the same as in the three-fold institutional classification of income), the share of self-employed farm labour and the share of non-farm self-employed in domestic income.

The table shows that the 'aggregate labour share of domestic income in the consolidated dual functional classification of income, increased by 2.57 percent over the terminal periods 1926-1930 to 1961-1965. The share has fluctuated between 75 and 77 percent of the domestic income during the post-war period. This small increase in the aggregate labour share was the result of counterbalancing trends in the share of paid employees and the share of self-employed labour. The share of self-employed workers over the periods 1926-1930 to 1961-1965 has declined compared with an increase in the share of paid employees. The fall in the share of the self-employed may have been on account of the increase in the size of business establishments and the inverse relationship between the size of establishment and the labour share.¹⁷ The share of the self-employed in agriculture has declined more than the share of non-farm owner-proprietors.

The labour share of domestic income shows very little change from 1926-1930 to 1961-1965 when agriculture, government and non-commercial sectors are excluded from the income totals. These exclusions have been justified on account of the disproportionate growth of agriculture and public

¹⁶ The long term interest rates were very high in the late 1920's. They had begun to fall by the end of the decade and were quite low until the end of the Second World War, when they began to rise. The rates, however, were still low in the early 1960's compared with the rates in the late twenties. See Lerohl and MacEachern, "Factor Shares in Agriculture".

¹⁷ S. A. Goldberg, p. 234.

administration and the measurement of non-commercial industries' output in employee compensation.

Table 6 presents the results of these exclusions. The table shows the labour share of domestic income, private domestic income (domestic income excluding government), non-farm domestic income (domestic income excluding agriculture), non-farm private domestic income (domestic income excluding both agriculture and government) and business product (domestic income excluding non-commercial industries) in the consolidated dual functional division of income produced by splitting the unincorporated income into labour income and investment income.

The labour share of private non-farm domestic income increased hardly at all (an increase of 0.14 percent) from 1926-1930 to 1961-1965 compared with an increase of 2.57 percent in the labour share of domestic product, 2.35 percent in the labour share of nonfarm domestic product and 0.20 percent increase in the labour share of business product over the same period. The labour share of private domestic product showed a small decline by 0.04 percent.

The estimate of the labour share of domestic income in various income totals in the functional division of income reveals that the shift from an unincorporated form of organization to a corporate form is removed by this classification. The exclusion of agriculture, where the proportion of unincorporated business is very high, does not affect the magnitude of change in the labour share of domestic income over the periods 1926-1930 to 1961-1965. The exclusion of government, whose share in total domestic income has risen considerably, neutralizes the small positive increase in the labour share. The labour share of business product (which differs from domestic income in that it excludes public and private non-commercial services) shows an increase of 0.20 percent from 1926-1930 to 1961-1965, compared with an increase of 2.57 percent in the labour share of domestic income over the same period.

Labour Share of Domestic Income in Canada: A Summary

The examination of the labour share of domestic income over the terminal periods 1926-1930 to 1961-1965, in the preceding pages, revealed that when adjustments were made for the earnings of self-employed, and non-commercial industries were excluded from the income totals, the labour share *was* nearly "constant". While the "unadjusted" labour share of domestic income increased by 17.78 percent from 1926-1930 to 1961-1965, the "adjusted" labour share (adjusted for labour income of the self-employed) rose by 2.57 percent only. The relative decline in the importance of agriculture and non-farm unincorporated business, over the terminal periods compared, appeared to have contributed to the apparent rise in the "unadjusted" labour share of domestic income. The exclusion of self-employed income from the income totals showed that the three percent increase in the labour share of corporate domestic income (domestic income excluding unincorporated income) from 1926-1930 to 1961-1965 was nearly the same as that of the adjusted labour share, compared with an increase of 17.78 percent of the labour share of domestic income in the three-fold institution division of income.

Table 4 - RELATIVE SHARES IN CORPORATE• DOMESTIC INCOME

Shares	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55	1956-60	1961-65	Percentage Change from 1926-30 to 1961-65
1. Labour Share	73.4	77.96	73.61	75.59	76.46	75.98	76.73	75.85	2.92
2. Profit Share	12.74	7.76	17.60	17.40	20.12	16.68	14.58	14.38	12.87
3. Rental Share	13.86	14.28	8.79	7.01	3.42	7.34	8.69	9.77	-29.51

Corporate Domestic Income was derived by subtracting total entrepreneurial income (farm and non-farm) from net domestic income.

Rental income is composed of rents, interest and miscellaneous investment income. It includes interest and dividends paid to non-residents but excludes interest and dividends received from Canadian residents abroad. It includes “inventory valuation adjustment”.

Source: *National Accounts*, D.B.S., Ottawa.

Table 5 - RELATIVE SHARES OF DOMESTIC INCOME IN THE FUNCTIONAL DIVISION OF INCOME

Shares	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55	1956-60	1961-64	Percent change from 1926-30 to 1961-65
I. Aggregate Labour Share	73.68	78.25	73.63	76.72	77.54	76.37	76.95	75.57	+ 2.57
(a) Share of paid workers	56.73	66.15	60.21	61.81	60.69	63.31	66.84	66.82	+17.79
(b) Imputed share of farm labour	8.34	3.58	5.61	8.28	8.83	6.54	3.32	3.01	-63.91
(c) Imputed share of non-farm self-employed labour	8.61	8.52	7.81	6.63	8.02	6.52	6.29	5.74	-33.33
II. Aggregate Property Share	26.32	21.75	26.37	23.28	22.46	23.63	23.55	24.43	- 7.18

NOTES:

I. (a) Wages, salaries and supplementary labour income as a percentage of domestic income. See Table 1.

(b) Imputed labour earnings of the self-employed farmers and unpaid family workers as a percentage of domestic income.

(c) Imputed labour income of the non-farm unincorporated business as a percentage of domestic income.

II. Property share includes share of profits, rents, miscellaneous investment income and inventory valuation adjustment.

Table 6 - AGGREGATE LABOUR SHARE OF DOMESTIC INCOME, EXCLUDING AGRICULTURE, GOVERNMENT AND NON-COMMERCIAL INDUSTRIES

Labour Share, using Various Income Totals	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55	1956-60	1961-65	Percent change from 1926-30 to 1961-65
Labour Share Domestic Income	73.68	78.25	73.63	76.72	77.54	76.37	76.45	75.57	+2.57
Labour Share of Non-Farm Domestic Income	74.15	79.61	74.29	75.70	76.42	75.94	76.71	75.89	+2.35
Labour Share of Private Domestic Income	71.75	75.69	70.33	72.15	75.41	73.79	73.26	71.72	-0.04
Labour Share of Non-Farm Private Domestic Income	71.88	76.94	71.18	70.21	73.86	73.03	73.34	71.98	+0.14
Labour Share of Business Product	70.54	74.38	69.68	71.54	74.82	73.16	72.05	70.68	+0.20
Labour Share of Non-Farm Business Product	70.47	75.54	69.86	69.58	73.14	72.10	72.14	70.91	+0.62

The inclusion of non-commercial industries (private and public) was also responsible for the apparent increase in the labour share. When non-commercial industries were excluded, the "adjusted" labour share (adjusted for unincorporated income) of domestic income showed very little increase from 1926-1930 to 1961-1965. The "adjusted" labour share of business product (defined as the domestic income excluding the non-commercial industries) increased by one-fifth of one percent (0.20 percent) compared with an increase of 2.57 percent in the adjusted labour share of domestic product.

Stability of the Labour Share

For a long time economists have maintained that capital and labour receive constant shares of national income. While short-run departures are acknowledged, these are regarded as part of a business cycle, for in the long run, it is argued, there is a strong tendency for the income shares to be constant.

What does an economist mean when he says that the labour share of national income has been stable or constant over time? What is the precise meaning of "constancy" when applied to the labour share? It does not mean that the share has been absolutely constant. It is implied, however, that the labour share has been more nearly constant than one would ordinarily expect. In statistical language it means that the coefficient of variation, an index of stability, is rather small.

One crude measure of variability is the examination of the labour share in two distant time periods. Such an examination was undertaken in the preceding pages. The analysis revealed that the labour share of domestic income over the periods 1926-1930 to 1961-1965 was affected by structural changes, such as the decline in the relative importance of agriculture and the growing importance of corporations as a form of business organization. In addition, the labour share fluctuated from year to year.

The estimation of the coefficient of variation is another measure of variability. It is an improvement on the examination of the behaviour of the labour share over two time periods, in that it measures deviations around an average. The coefficient is not affected by mild cyclical fluctuations in the share. Table 7 shows the two measures of variability, the variance, and the coefficient of variance of the labour share of domestic income in the three-fold institutional division, the two-fold functional division of domestic income and the corporate domestic income. The labour share in the three-fold division of income is referred to as the "unadjusted" labour share; the labour share in the two-fold functional division of income is designated "adjusted" labour share.

Table 7 - VARIANCE OF THE LABOUR SHARE OF DOMESTIC INCOME, 1926-1966

Labour Share	Variance (σ^2)	Coefficient of Variation (σ/x)
Net Domestic Income		
1. Unadjusted	0.0014	0.0605
2. Adjusted	0.0004	0.0266
3. Corporate	0.0003	0.0237
Non-Farm Domestic Income		
1. Unadjusted	0.0006	0.0356
2. Adjusted	0.0004	0.0262
3. Corporate	0.0004	0.0261
Private Domestic Income		
1. Unadjusted	0.0014	0.0640
2. Adjusted	0.0005	0.0314
3. Corporate	0.0004	0.0247
Net Business Product		
1. Unadjusted	0.0013	0.0643
2. Adjusted	0.0005	0.0314
3. Corporate	0.0004	0.0247
Non-Farm Business Product		
1. Unadjusted	0.0005	0.0370
2. Adjusted	0.0005	0.0324
3. Corporate	0.0006	0.0361

The table shows that the coefficient of variation of the labour share of domestic income fluctuated between .0237 (or 2.37 percent) to .0605 (or 6.05 percent). The unadjusted labour share (the labour share in the three-fold classification of income between labour income, investment income and unincorporated income) varied more than the adjusted labour share (adjusted in that the unincorporated income was split between labour and capital and added to labour income and investment income) and the labour share of corporate domestic income (domestic income excluding the unincorporated income). The actual variance of the unadjusted labour share of domestic income was more than three times the variance of the adjusted labour share. This conclusion vindicates the argument that the shift from an unincorporated to a corporate form of business has been one of the main reasons behind the variability of the labour share of domestic income. The coefficient of variation of the labour share in total domestic income is about two and a half times more than the coefficient of variation of the labour share of corporate domestic income.

The comparison of the coefficient of variation of the labour share in various income totals further demonstrates the effect of organizational and structural shifts on the labour share of domestic income. In the unadjusted national accounts framework while the labour share of domestic income varied by 6.05 percent over the period 1926-1966, the labour share of non-farm domestic income varied by only .356 percent. The exclusion of government and personal non-commercial services hardly affected the variability of the share: the coefficient of variation of the labour share of private domestic income (domestic income excluding government) and net business product (domestic income excluding non-commercial industries) was nearly the same as that of the labour share of domestic income. The labour share of non-farm business product, however, varied considerably less than the labour share of domestic

product or the labour share of business product. In addition, the coefficient of variance of the unadjusted labour share of non-farm business product was nearly equal to the coefficient of variation of the adjusted labour share and the corporate labour share. Evidently, the secular decline in the relative importance of agriculture had a decisive influence on the variability of the labour share of domestic income.

The Solow Test

Although the coefficient of variance of the labour share of domestic income in Canada has been rather small, it still does not say much about the stability of the share. The stability indicated by the coefficient of variation may be more apparent than real. The aggregate share might be stable although there could be considerable inter-industry weight shifts. To establish that the observed stability of the labour share is real, it is necessary to show that the stability of the share is not due to inter-industry shifts.

Professor R. M. Solow¹⁸ has provided an internal standard of variability to test the stability of the aggregate share of labour. The standard is based on the identity that the aggregate labour share of national income is a weighted average of the labour share in the component industrial sectors of the national economy — weights being the constant proportion of total output originating in each sector. Very simply, if the aggregate labour share is constant and there is no correlation among changes in the sector weights, or if positive and negative correlations offset each other, the variance of the labour share can be expressed as:

$$(1) \sigma^2 = \sum_{i=1}^k W_i^2 \sigma_i^2$$

where σ^2 is the variance of the aggregate labour share, σ_i^2 is the variance of the labour share in component industry sectors, and W_i is the value added weight of the i th sector in total output, or the share of i th industry output in national income. If the theoretical variance of the aggregate labour share, calculated from equation (1) is not significantly different from the actual variance, it could be argued that the aggregate labour share varies as much as it would vary if the shares of individual industries' output fluctuated independently, with positive and negative inter-correlations approximately offsetting each other. If, however, the actual variance were significantly different from the theoretical variance, inter-correlations would exist among sector weights. A more detailed test on interindustry weight shifts as the possible influence on the stability of Labour share will be discussed later.

Stability of the Labour Share of Business Product in Canada

The Solow test was applied to test the stability of the labour share of business product in Canada over the period 1926-1966. The business product rather than the domestic product was chosen for the analysis because it excludes government and private noncommercial industries, whose output is measured in terms of employee compensation rather than value added. Furthermore, these industries do not operate on profit motive. The 1949 value added weights were used. The industry breakdown of the business product was limited to eleven broad sectors due to the limitations of data giving a finer breakdown.

¹⁸ R. M. Solow, "A Skeptical Note...", pp. 621-623.

Table 8 gives the variance of the labour share in eleven industrial sectors in the three-fold classification of business product (labour income, investment income and unincorporated income) for the period 1926-1966. The table also shows both the current weighted overall labour share and the fixed weight series using 1949 value added weights. The two series (fixed weight series and current weight series) behave differently. While the current weighted labour share of business product increased from 50.42 percent in 1926 to 62.70 percent in 1966, the fixed weight series labour share showed an increase of only 5 percentage points, reflecting the influence of interindustry weight shifts during the last four decades. The variance of the labour share in current weighted series was nearly twice the variance of the fixed weight overall labour share. Except for the finance industry, the labour share in practically all industries varied more than the aggregate labour share.

The theoretical variance of the unadjusted labour share of business product, calculated from equation (1) was .0004 compared with the actual variance of .0008. The theoretical variance of the labour share in the three-fold division of income was, therefore, significantly different from the actual variance. In crude terms, the unadjusted labour share of business product could not be considered stable. The results of the test are in line with the analysis of change over two distant five-yearly terminal periods (see above).

Stability of the Adjusted Labour Share

The wide discrepancy between the theoretical and the actual variance of the unadjusted labour share reflects the influence of structural shifts within the Canadian economy. The influence of these structural shifts, the decline in the relative importance of agriculture and unincorporated income, is considerably minimized when adjustments are made for the labour income of self-employed labour. Undoubtedly, these adjustments conceal the organizational shifts. Nevertheless, they are necessary in order to put the empirical analysis of factor shares in the logical framework of distribution theory. Table 9 illustrates the variance of the adjusted labour share (adjusted by splitting unincorporated income in each industry and adding to the labour income and investment income) of business product over the period 1926-1966. The table also shows both the current weight and the fixed weight, using 1949 weights, series of overall labour share. In only five out of 41 years (1933-37) did the use of fixed weights result in a change in the aggregate labour share of more than 2 percentage points. The variability of the share, measured by its variance, was hardly affected at all. The variance of the fixed weighted labour share of business product was nearly equal to the variance of the current weighted labour share.

The theoretical variance of the adjusted labour share, calculated from equation (1), was nearly the same as the actual variance. The actual variance (using fixed weights) was 0.0005 compared to the theoretical variance of 0.00044. This difference is virtually insignificant, statistically. In view of this test it could be concluded that the adjusted labour share of business product (adjusted for the returns to labour input in unincorporated income) was stable or that the share varied "just about as much as it would vary if the individual sector shares fluctuated independently, with positive and negative intercorrelations approximately offsetting each other".

Table 8 - LABOUR SHARE IN SELECTED INDUSTRIAL SECTORS OF THE COMMERCIAL ECONOMY, 1926-1966, IN THE THREE-FOLD CLASSIFICATION OF BUSINESS PRODUCT

Ind. Sectors	1949 Weight	1926	1929	1937	1947	1953	1958	1962	1966	Variance (1926-1966)
Agriculture	.1184	.1408	.1934	.1849	.1010	.0880	.1242	.1136	.0893	.0031
Forestry	.0203	.9218	.9078	.9125	.9084	.8591	.9028	.9093	.9596	.0016
Fishing	.0052	.2121	.2333	.2222	.2800	.3571	.3132	.3333	.3592	.0031
Mining	.0397	.5827	.5544	.4370	.5447	.6556	.6569	.5854	.5832	.0042
Manufacturing	.3222	.6921	.6919	.7208	.7313	.7219	.7518	.7381	.7643	.0016
Construction	.0626	.7711	.8055	.7297	.7281	.7194	.7387	.7856	.8471	.0016
Trans. Communication & Utilities	.1146	.7368	.7491	.7331	.7108	.7492	.7469	.6999	.6546	.0039
Wholesale Trade	.0556	.7354	.7513	.8203	.6021	.7152	.7498	.7816	.7709	.0046
Retail Trade	.1105	.5055	.5244	.6094	.5077	.5811	.5900	.6148	.6482	.0026
Finance etc.	.0667	.2909	.3212	.3580	.4571	.3245	.3152	.2790	.3221	.0012
Services	.0841	.3440	.3509	.3794	.4817	.4813	.4792	.5031	.5707	.0037
Total (current weights)		.5042	.5507	.5728	.5723	.5924	.6179	.6076	.6270	.0014
Fixed Weight Total		.5604	.5744	.5896	.5767	.5853	.6030	.5964	.6133	.0008

Stability of the Labour Share: Summary

The examination of the coefficient of variation of the labour share and the application of the Solow test to the labour share of business product in Canada reveal that the adjusted labour share (adjusted for labour income of the self-employed) was nearly constant during the period 1926-1966. The unadjusted labour share (the labour share in the conventional three-fold classification of national income) apparently showed a positive increase. This increase in the share was due to the decline in the relative importance of agriculture over the past four decades and the growing importance of corporate form in business establishments. When unincorporated income is split into labour and capital and added to total labour income and investment income, the impact of the structural changes on the variability of labour share is minimized. A more detailed analysis of net inter-industry shifts and their impact on the behaviour of labour share will be described in the following pages, which will show how much of the change in the labour share was due to interindustry weight shifts, and how much was attributable to the change in industry labour share.

Table 9 - LABOUR SHARE IN SELECTED INDUSTRIAL SECTORS OF THE COMMERCIAL ECONOMY, 1926-1966, IN THE TWO-FOLD CLASSIFICATION OF BUSINESS PRODUCT

Ind. Sectors	1949 Weight	1926	1929	1937	1947	1953	1958	1962	1966	(1926-1966) Variance
Agriculture	0.1184	0.6377	0.8647	0.6374	0.8724	0.8063	0.7159	0.7279	0.7304	0.0087
Mining	0.0397	0.6043	0.5699	0.4477	0.5555	0.6619	0.6615	0.5934	0.5861	0.0044
Manufacturing	0.3222	0.7341	0.7332	0.7632	0.7701	0.7430	0.7715	0.7587	0.7807	0.0016
Construction	0.0626	0.9651	0.9756	0.9797	0.9506	0.8961	0.8737	0.9402	0.9565	0.0009
Trans. Communication & Utilities	0.1146	0.7477	0.7668	0.7657	0.7458	0.7730	0.7662	0.7163	0.6692	0.0042
Wholesale Trade	0.0556	0.8129	0.8324	0.9161	0.6778	0.7673	0.7859	0.8095	0.8000	0.0054
Retail Trade	0.1105	0.7402	0.8004	0.8654	0.7360	0.7732	0.7767	0.8036	0.8156	0.0042
Finance, etc.	0.0667	0.3022	0.3438	0.3796	0.4821	0.3356	0.3247	0.2838	0.3284	0.0015
Services	0.0841	0.7520	0.7483	0.7202	0.8248	0.8015	0.7844	0.7806	0.8159	0.0021
Total (current weights)		0.6979	0.7427	0.7180	0.7687	0.7418	0.7314	0.7211	0.7351	0.0047
Fixed Weight Total		0.7177	0.7555	0.7461	0.7644	0.7486	0.7446	0.7389	0.7487	0.0005

PART II: LABOUR SHARE AND INTER-INDUSTRY SHIFTS

The analysis in the last part revealed that the long run behaviour of the labour share was significantly affected by changes over time in the share of agriculture and government in domestic income. The structural changes in the Canadian economy are, however, not limited to agricultural and government sectors alone; there have been marked shifts in practically all sectors of the economy. In this chapter, changes in the weight of various industrial sectors in total output and their labour share are examined to determine their impact on the long run behaviour of the labour share in domestic income. The "alleged" inverse relationship between changes in industry weights and changes in industry labour share as the basis of stability of the aggregate labour share is also investigated. The analysis is carried out for both the functional and the institutional classification of income. The Dunlop model, which shows the labour share of national income as a weighted sum of labour share in the output of micro production units, is employed.

"The alternative concepts of 'income', labour's return and the derivative meanings of 'share'," according to Professor Dunlop, "are applicable to a single enterprise as well as to varying aggregates including the total system." The concept of relative shares is applicable to the production function of a firm as well as to the aggregate production function of the economy. "When more than one enterprise is combined, the share of the aggregate income going to labour will depend upon both the share in each firm and the relative amounts of incomes generated by each concern." Changes in an industry labour share or the aggregate labour share come about from changes in the labour share in each firm in the output of the industry or the total national income. This relationship can be explained by the following equation:¹⁹

$$(1) \quad L/Y = \sum_{i=1}^k (l_i/y_i) \cdot (y_i/Y) = \sum_{i=1}^k (P_i \cdot W_i) \cdot \frac{l_i}{y_i} = \sum_{i=1}^k C_i$$

Where (a) L/Y is the aggregate labour share (L being total labour income and Y being national income);

- b) l_i/y_i is the labour share of firm, industry or sector. Dunlop calls it "rate of participation" and designates it P_i ;
- c) y_i is the output of the firm, industry or sector and y_i/Y the weight of that firm, industry or sector in total national income, It is designated W_i ;
- d) L_i/Y is the ratio of labour income in a firm, industry or sector Y

(l_i) to total income of the system (Y), called the "rate of contribution" (C_i) of the sector in aggregate labour share. The rate of contribution is the industry labour share multiplied by the weight of the industry in total income, *i.e.*, $C_i = P_i \cdot W_i$. The sum of all "contribution rates" must equal the share of labour in total income ($\sum C_i = L/Y$). Any change in the aggregate labour share can, therefore, be reduced to variations in the rates of contribution of component segments or, alternatively, to

¹⁹ JJ. T. Dunlop, *Wage Determination under trade unions* (New York: MacMillan, 1944), pp. 163-164. Also see James W. Beck, "An Interindustry Analysis of Labor's Share", *Industrial and Labor Relations Review*, XI (January 1958), pp. 231-246.

changes in industry labour share and weights of the industries in total output. It could be formalized in the following equation which is a derivative form of equation (1)

$$(2) \Delta L/Y = \sum_{i=1}^k \Delta C_i = \sum_{i=1}^k (W_i \cdot \Delta P_i + P_i \cdot \Delta W_i) + \text{unexplained residual}$$

In the first term ($W_i \cdot \Delta P_i$) on the right hand side of the equation (2), industry weight is held constant while labour share is varied to explain the effect of pure changes in the industry labour share on the changes in the aggregate labour share. In the second term, ($P_i \cdot \Delta W_i$), industry labour share is held constant while the weight of the industries in total output is varied to measure the impact of pure inter-industry weight shifts on changes in the labour share. The last term of the equation ($\Delta P_i \cdot \Delta W_i$) is an unexplained residual. It is that part of the change in the labour share which is attributable to a joint change in weight shift (W_i) and industry labour share (P_i). Two of the items in the above equation are restrained but in an unequal manner: (1) the sum of industry weights W_i , must be unity as W_i measures the percentage share of an industry in total output; (2) similarly, ΔW_i must be equal to zero because as some industries increase in relative importance, others must inevitably decrease.

In the following pages the relationship between the weight shifts and the labour share of major industrial sectors in commercial domestic income or net business product, as it is referred to in Canadian national accounts, has been examined. An attempt has been made to investigate the extent to which the increase in the labour share of business product is accounted for by the changes in the weights of the sectors and the changes in the sectoral labour share. For this purpose, W , P and C of the Dunlop model in 1926-1930 and 1961-1965 have been calculated. These calculations were made for both the three-fold institutional division of business product between wages and salaries, investment income and entrepreneurial income and the two-fold functional division of income between property income and labour income in each sector. The functional division requires estimation of labour income in net farm income and unincorporated non-farm business income. The returns to labour in non-farm self-employed business incomes were calculated on the assumption that the ratio of wages and salaries to corporate income in each sector was exactly the same as the ratio of wages and salaries to entrepreneurial income. For the agricultural sector, direct calculations were made by imputing an arbitrary rate of return on the value of total farm capital to calculate property income and treating labour income as the residual.

The choice of net business product against net domestic income was largely influenced by the structure of the theoretical model. The net business product excludes non-commercial government and personal services in which output is measured in terms of labour compensation. The inclusion of these sectors would not have helped the analysis, for the simple reason that the unity labour share of these sectors would have exaggerated the influence of shifts in the sectoral weights on the change in the aggregate share of labour, particularly since the weight of the government sector in domestic income has shown a steep upward trend.

Framework

The first section of this part examines changes in the value added weights of eleven industrial sectors in net business product from 1926-1930 to 1961-1965. The second section analyzes changes in the labour share of eleven industries, both in the unadjusted (threefold institutional division of income) and in the adjusted (by splitting unincorporated income into labour income and investment income) accounts. The third section investigates changes in the aggregate labour share attributable to pure inter-industry shifts,

pure changes in industry labour share and joint changes in industry weight and labour share. The last section discusses the inverse relationship between weight shifts and changes in industry labour over two reference cycles, 1929-1933 and 1957-1958.

Inter-Industry Weight Shifts

Table 10 shows changes in the value added weights of eleven industrial sectors in net business product over the terminal periods 1926-1930 to 1961-1965. The table reveals that while six industrial sectors increased their proportion in total business product, the weight of five industries declined. Agriculture was the most prominent sector in weight-losing industries. The share of agriculture in total business output declined by 63 percent. The relative importance of the fishing and trapping industry also declined by 57 percent, reflecting the transformation of semi-rural Canada into an industrial society. The weight of services, transport, communication and utilities also declined but the rate of decline was quite small compared with agriculture, fishing and forestry.

Among the six weight-gaining industries (industries whose proportion in total business product showed an increase) manufacturing, construction, wholesale trade and finance increased their share by more than 20 percent. Wholesale trade gained the most, followed by finance, construction and manufacturing. The service sector, in general, increased its weight and the goods-producing sector declined in relative importance. The weight of primary industries declined considerably.

Another significant feature of the inter-industry shifts was the fall in the weight of those industries where the proportion of unincorporated income was high. The only exceptions were construction and retail trade whose weight in total business output increased.

Changes in the Industry Labour Share

In addition to inter-industry weight shifts, change in the industry labour share is an important factor affecting the long-run behaviour of factor share because these changes roughly indicate changes in factor proportions. Table 11 shows changes in both the unadjusted and the adjusted labour share of industries (adjusted for unincorporated labour income to facilitate the division of total income between labour income and investment income).

The table shows that in the unadjusted accounts while the labour share in six industrial sectors increased, the labour share in five industries showed a declining trend. The labour share of commercial services and fishing output showed the greatest increase, by more than 50 percent, followed by retail trade, wholesale trade, manufacturing and construction. In the industries, where labour share declined, agriculture rated first. The labour share in agriculture declined by 24 percent over the period 1926-1930 to 1961-1965. Other industries where labour share declined were forestry, mining, transportation and finance.

Table 10 - INTER-INDUSTRY WEIGHT SHIFTS

Industry	Weight in 1926-30	Weight in 1961-65	Point Change in Weight	Percentage Change from 1926-30 to 1961-65
Agriculture	0.1642	0.0613	-0.1029	-62.67
Forestry	0.0157	0.0133	-0.0024	-15.29
Fishing	0.0069	0.0029	-0.0040	-57.97
Mining	0.0376	0.0390	+0.0014	+3.72
Manufacturing	0.2460	0.3036	+0.0576	+23.41
Construction	0.0553	0.0683	+0.0130	+23.51
Total Goods Producing Industries	0.5257	0.4884	-0.0373	-7.09
Transport, Communication, and Utilities	0.1376	0.1308	-0.0068	-4.94
Wholesale Trade	0.0447	0.0579	+0.0132	+29.53
Retail Trade	0.1003	0.1113	+0.0110	+10.97
Finance, Insurance and Real Estate	0.0914	0.1170	+0.0256	+28.01
Commercial Services	0.1003	0.0946	-0.0057	-5.68
Total Service Industries	0.4743	0.5116	+0.0373	+7.86
TOTAL	1.000	1.000	0.00	

SOURCE: *National Accounts*, D.B.S., Ottawa.

Table 11 - CHANGES IN INDUSTRY LABOUR SHARE

Industry	Unadjusted Labour Share			Adjusted Labour Share		
	1926-30	1961-65	Percentage Change	1926-30	1961-65	Percentage Change
Agriculture	0.1567	0.1185	-24.38	0.6873	0.6998	+1.82
Forestry	0.9136	0.9049	-0.95	0.9702	0.9843	+1.45
Fishing	0.2281	0.3450	+51.25	1.0000	1.0000	
Mining	0.5875	0.5629	-4.19	0.6062	0.5665	-6.65
Manufacturing	0.6845	0.7397	+8.06	0.7256	0.7591	+4.62
Construction	0.7808	0.7949	+1.81	0.9661	0.9435	-2.35
Transportation, Communication & Utilities	0.7483	0.6822	-8.83	0.7640	0.6986	-8.56
Wholesale Trade	0.6774	0.7744	+14.32	0.7434	0.7744	+4.17
Retail Trade	0.5153	0.6186	+20.05	0.7583	0.8018	+5.74
Finance, Insurance, and Real Estate	0.3195	0.3039	-4.88	0.3379	0.3099	-8.29
Commercial Services	0.3389	0.5160	+52.26	0.7087	0.7869	+11.03
Total Business Product	0.5209	0.6104	+17.18	0.7054	0.7154	+1.42

In the adjusted accounts, when unincorporated income was split into labour and capital, the ranking of some industries was reversed. The adjusted labour share of agriculture and forestry showed a small increase compared with a decline in the unadjusted labour share. Similarly, the adjusted labour share in construction declined, compared with a small increase in its unadjusted labour share. The magnitude of change was quite small in the adjusted labour share in all industries. The share increased most in commercial services but the percentage increase in the adjusted share was only 11 percent as against a more than 50 percent increase in the unadjusted labour share. In addition to commercial services, the labour

share also increased in agriculture, forestry, manufacturing, wholesale trade and retail trade. The percentage change in the labour share of industries was in tune with the percentage increase in the aggregate labour share of business product over the period 1926-1930 to 1961-1965. The adjusted labour share of business product over this period increased by 1.42 percent compared with an increase of 17.18 percent in the unadjusted labour share.

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Components of Change in the Aggregate Labour Share

The total change in the aggregate labour share of business product from 1926-1930 to 1961-1965, both adjusted and unadjusted, can be attributed to inter-industry shifts and changes in industry labour share. The residual (one that could not be explained by the above two factors) can be assigned to the joint changes in inter-industry shifts and industry labour share changes. Table 12 shows the amount of change in the unadjusted and adjusted labour share that was due to inter-industry shifts and changes in the industry labour share. It also shows the contribution of each industry to the variation in the aggregate labour share of business product over the terminal periods 1926-1930 to 1961-1965. The contribution of each industry was derived by multiplying the weight of an industry in business product by its labour share in 1926-1930 and 1961-1965 and then taking the difference. This rate of contribution, as Dunlop calls it, is, in effect, the change in the weighted labour share of an industry. The sum of the weighted shares in two terminal periods is equal to the aggregate labour share of the business product. When positive and negative changes in the weighted labour share of industries are totalled, they equal total change in the aggregate labour share. The table shows that in the unadjusted classification of business product, positive changes in the weighted labour share of industries outweigh negative changes, resulting in 8.95 percentage points increase in the unadjusted aggregate labour share. The weighted share of agriculture, forestry, fishing, mining and transport, communication and utilities declined, while the

weighted labour share of manufacturing, construction, trade, finance and commercial services increased. Industries that showed negative change were those where both the value added weight (except for mining) and the unadjusted labour share (except for forestry) fell during the period 1926-1930 to 1961-1965 (see Tables 10 and 11). Industries with positive rates of contribution had shown increases in their weight (except for services) and labour share (except for finance). The 9.5 percent increase in the aggregate labour share of business product was a result of positive and negative changes in the contribution of industries. This increase was reduced to only one percent in the dual classification of business product when unincorporated income was split into labour and capital. The adjustment led to moderation in positive increases in contribution rates and pushing up the negative rates. The negative rate of contribution of agriculture, for example, rose from 1.88 percent to 7.00 percent. The impact of the adjustment was felt in those industries where the proportion of unincorporated income was high. As a result of the adjustment, positive increases in the weighted labour share of industries nearly offset the negative increases and considerably reduced the variation in the aggregate labour share of business product over the period 1926-1930 to 1961-1965.

The Impact of Inter-Industry Shifts

The inter-industry shifts had a decisive influence on the behaviour of the aggregate labour share of business product in Canada over the terminal periods 1926-1930 to 1961-1965. Of the 8.95 percent increase in the unadjusted labour share, more than 50 percent was attributed to pure inter-industry shifts (see Table 12), and 33 percent to changes in industry labour share. The effect of industry weight shift was considerable in agriculture, forestry, fishing, mining, manufacturing, construction, wholesale trade and finance. While manufacturing, construction, mining, wholesale trade and finance showed positive increases, agriculture, forestry, and fishing registered negative changes.

In the adjusted dual functional classification of business product, inter-industry shifts did not affect the behaviour of the aggregate labour share. If anything, the net inter-industry shifts were negative in the adjusted business product. The positive shifts in the value-added weights of manufacturing, construction, trade (wholesale and retail) and finance were neutralized by a decline in the relative importance of agriculture, forestry and fishing, although in all industries except for transport and commercial services, weight shifts were very significant.

In summary, the inter-industry weight shifts were an important factor in the trend of the behaviour of the unadjusted labour share. When adjustments were made, however, for splitting unincorporated business income into labour and investment income, the influence of inter-industry shifts disappeared. The results of the Dunlop test in this regard were identical to the conclusions reached with the Solow test. In the Solow test the unadjusted series of current weighted and fixed weighted (using 1949 value added weights), labour share diverged considerably compared with the nearly identical behaviour of the share in the adjusted series.

Table 12 – SOURCES OF CHANGE IN THE LABOUR SHARE OF BUSINESS PRODUCT IN CANADA

Industry	Contribution to Changes in the Unadjusted Aggregate Labour Share	Sources of Change (in percentage)			Contribution to Changes in the Adjusted Aggregate Labour Share	Sources of Change (in percentage)		
		Pure Interindustry Shifts	Pure changes in Industry Share	Residential Share		Pure Interindustry Shifts	Pure changes in Industry Share	Residential Share
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Agriculture	-0.0137 (100.00)	-87.03	-33.51	+21.08	-0.0700 (100.00)	-101.00	+3.00	-4.00
Forestry	-0.0185 (100.00)	-91.30	-4.35	-4.35	-0.0021 (100.00)	-109.52	+9.52	--
Fishing	-0.0023 (100.00)	-180.00	+160.00	-80.00	-0.0040 (100.00)	-100.00	--	--
Mining	-0.0005 (100.00)	+800.00	-900.00	+100.00	-0.0007 (100.00)	+114.29	-214.29	--
Manufacturing	+0.0562 (100.00)	+70.11	+24.02	+5.87	+0.0520 (100.00)	+80.38	+15.96	+3.66
Construction	+0.0129 (100.00)	+78.29	+5.43	16.27	+0.0110 (100.00)	+114.55	-10.91	-3.64
Transport	-0.0001 (100.00)	-36.50	-65.69	+2.19	-0.0138 (100.00)	-37.68	-65.22	-2.90
Communication and Utilities								
Wholesale Trade	+0.0146 (100.00)	+60.96	+29.45	+9.59	+0.0116 (100.00)	+84.48	+12.07	+3.45
Retail Trade	+0.0172 (100.00)	+32.56	+59.88	+7.56	+0.0132 (100.00)	+62.88	+33.33	+3.79
Finance, Insurance and Real Estate	+0.0063 (100.00)	+128.57	-22.22	-6.34	+0.0054 (100.00)	+159.26	-48.15	-11.11
Commercial Services	+0.0174 (100.00)	-0.57	+101.72	-1.15	+0.0074 (100.00)	-5.41	+105.41	--
Total Business Product	+0.0895 (100.00)	+54.41	+33.80	+12.41	+0.0100 (100.00)	-7.00	+98.00	+9.00

The Influence of Changes in the Industry Labour Share

The pure changes in unadjusted industry labour share (when industry weights are kept constant and labour share is varied) were quite insignificant compared with the inter-industry shifts in the unadjusted accounts. Out of a total 8.95 percent increase in the unadjusted labour share of business product over the period 1926-1930 to 1961-1965, only 33.8 percent increase was accounted for by pure changes in the unadjusted industry labour share, compared with 54.41 percent due to the inter-industry shifts. In mining, transport, communications and utilities, retail trade and services, changes in the labour share accounted for more than 50 percent change in the rate of contribution of these industries. In all other industries the percentage change of weighted labour share attributable to changes in the unadjusted labour share was quite small. In the adjusted accounts, however, 98 percent of the increase in the aggregate labour share of business product from 1926-1930 to 1961-1965 was accounted for by pure changes in industry labour share. The contribution rate of commercial services, transport, communication and utilities and mining was significantly affected by changes in the labour share. In all other industries, however, pure changes in adjusted labour share had no influence on the changes in weighted labour share (rates of contribution).

The residual change or the joint change in industry weights and labour share had no significant effect on the behaviour of the aggregate labour share, adjusted or unadjusted. In the unadjusted labour share only 12.41 percent of the increase was due to the joint changes in industry weights and labour share. In the adjusted accounts, a 9 percent increase in the aggregate labour was explained by the joint effect. In no industry except mining did the joint effect have any influence on the changes in contribution rates.

Sources of Change in the Labour Share of Business Product: A Summary

The application of the Dunlop test to the behaviour of the labour share of business product in Canada over the two terminal periods 1926-1930 to 1961-1965 revealed that in the unadjusted or the three-fold classification of business product, more than half of the apparent increase in the labour share was due to the inter-industry shifts. The changes in industry labour share over the two terminal periods were responsible for nearly one-third of the total increase in the aggregate labour share. When the three-fold classification was converted into the two-fold functional classification of income into labour and capital, it was disclosed that 98 per cent of the increase in the labour share of business product was accounted for by changes in industry labour share. The inter-industry weight shifts had no effect on the behaviour of the labour share because the positive changes in the weights of some industries were offset by the negative changes in other industries. The split of unincorporated income into labour income and investment income wiped out the net influence of inter-industry shifts due to a very high correlation between interindustry weight shifts and a secular decline in the relative importance of self-employed income. The results of the Dunlop test were similar to the findings from the Solow test.

Table 13 - PERCENTAGE CYCLICAL CHANGE IN INDUSTRY WEIGHTS AND INDUSTRY LABOUR SHARE, 1929-33 AND 1957-58

Industries	1929-33				1957-58			
	P Δ W	W Δ P	P ₁ Δ W	W Δ P ₁	P Δ W	W Δ P	P ₁ Δ W	W Δ P ₁
1. Agriculture	-6.09	7.10	-27.22	-3.45	-20.40	-0.57	7.39	0.15
2. Forestry	-22.70	-0.03	-31.82	0.01	1.46	0.03	-22.41	0.04
3. Fishing, Trapping	-7.42	0.19	-24.01	0.00	13.18	-0.03	-6.91	0.00
4. Mining	11.66	-0.05	11.98	0.03	-6.86	0.33	37.04	0.33
5. Manufacturing	-4.48	5.63	-4.75	6.16	-3.36	0.45	-3.45	0.42
6. Construction	-41.35	-0.53	-50.08	0.16	-1.34	-0.12	-1.59	-0.13
7. Transportation, Communication, Utilities	13.19	1.55	13.50	1.80	-0.29	0.00	-0.30	0.02
8. Wholesale Trade	18.14	0.87	20.10	0.83	-1.25	0.14	-1.29	0.19
9. Retail Trade	1.15	3.09	1.76	1.45	3.21	-0.39	4.26	-0.49
10. Finance, Insurance, Real Estate	14.37	0.76	15.39	0.52	3.53	-0.73	3.64	-0.76
11. Services	2.69	1.41	5.73	-0.54	1.90	0.04	3.12	0.03
Totals:	-20.84	19.99	-69.42	6.97	-10.22	-0.85	19.50	-0.20

Notations: P is the 'unadjusted' industry labour share in the three-fold division of income.

P₁ is the 'adjusted' industry labour share in the two-fold function division of income.

W is the share of each industry in total output.

Δ W and Δ P or Δ P₁ refer to changes in weights and labour share of industries

Inverse Relationship Between Sector Weights and Labour Share

According to Professor Dunlop, an inverse relationship between industry weight shifts and changes in the industry labour share tends to make for a relatively stable aggregate labour share.²⁰ The labour share increases most in those industries whose share in total output declines in periods of recession. He classifies industries according to the movement of their share in total output. Using his terminology, "weight-losing sectors" would be those sectors whose share in total output declined during the contraction phase of the business cycle. Industrial sectors whose weight increased during the recession would be designated "weight-gaining sectors".

This relationship was investigated for the eleven industrial sectors in Canadian business product in the two recession periods, 1929-1933 and 1957-1958. Percentage changes in the industry labour share and the share of industries in total business product over the two periods of recession in Canada, 1929-1933 and 1957-1958 have been presented in Table 13. The two periods approximate reference cycle dates.

The table shows that in the 1929-1933 depression, agriculture, forestry, fishing, manufacturing and construction lost their share in business product while mining, transport, communication, utilities, trade (wholesale and retail), finance and commercial services increased their weight. Construction showed the heaviest loss, while wholesale trade witnessed the largest gain. In the 1957-1958 recession, wholesale trade, transport, communication and utilities, mining, fishing and agriculture reversed their positions. Agriculture and fishing, contrary to their behaviour in 1929-1933, increased their share in business product, while wholesale trade, transportation and mining showed loss in their weight. Fishing gained the most and forestry lost heavily.

In the three-fold classification of income, all industry sectors except forestry, mining and construction showed an increase in their labour share during the 1929-1933 recession. In forestry, mining and construction, although the labour share declined, the fall was less than one percent. The largest increase in industry labour share was in the manufacturing and agricultural sectors, whose weight in business product fell. All the service industries, including transportation, communication and utilities, showed a direct relationship between weight shift and changes in the labour share; during the 1929-1933 recession both the share of these industries in business product and their labour share increased. There was no significant change in this pattern when self-employed income was broken down into labour income and property income. In the two-fold functional classification of income, the labour share in the commercial services declined. The industrial labour share in mining and forestry increased contrary to declining trends in the three-fold classification of income. Agriculture, however, showed a decline in its labour share when unincorporated farm income was divided into labour income and non-weight shift and changes in the labour share; during the 1929-1933 recession, increases in the industry labour share had dominating influence on the aggregate labour share in business product which increased during this period.

In the 1957-1958 contraction, the labour share in the three-fold classification of income increased in all those sectors, except in construction, whose share in business production declined. Construction showed a decline both in its weight and in the labour share. Practically all industries except for services and

²⁰ J. T. Dunlop, pp. 165-173.

construction indicated an inverse relationship between changes in labour share and weight shifts. In the two-fold functional classification of income when self-employed income was divided into labour income and non-labour income, this relationship remained unchanged, barring agriculture where the inverse relationship was reversed into a direct relationship between weight shifts and the labour share. In the 1957-1958 recession, both the weight shifts and the changes in the labour share affected the cyclical behaviour of the aggregate labour share in business product in the threefold classification of income. In the twofold functional classification, only changes in industry labour share influenced cyclical changes in the labour share in business product.



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