The Scandinavian Model of Inflation and its Applicability to Australian Wage Setting

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This study discusses the applicability of the so-called Scandinavian Model (SM) of inflation to the design of wage setting principles in Australia. It is motivated by three major factors. First, Australia like the Scandinavian countries (Sweden being typical) is a small economy exposed to international trading markets. Second, institutions dominate wage fixing in Australia and Sweden, although there are substantial differences in the nature of the centralised institutional interaction in each country. Third, with Australia beset by on-going external payments problems, the task of maintaining international competitiveness is a central concern for wages policy.

Local commentators have argued that adjusting wages in line with domestic price movements endangers our international competitiveness. These concerns have led to the explicit discounting of wage increases in National Wage Cases (NWC) to account for the import price effects on the Consumer Price Index (CPI). The SM describes a wage setting system whose primary goal is to maintain the competitiveness of the trading sector. Accordingly, the SM could be useful in designing wage setting principles for Australia.

In this article we summarise the SM (with a more formal exposition appearing in the Appendix) and extend it to incorporate flexible exchange rates. We discuss how discretionary taxation policy can act as a quasi incomes policy by frustrating nominal wage demands. Finally, the empirical applicability of the SM for Australia is assessed.

The Scandinavian Model

Features of the SM

The SM dichotomises the economy into a competitive sector (C-sector) and a sheltered sector (S-sector). The C-sector produces products which are traded on world markets and its prices follow the general movements in world prices. The C-sector serves as the leader in wage settlements. The S-sector does not trade its goods externally. Under fixed exchange rates, the C-sector maintains price competitiveness if the growth in money wages in its sector is equal to the rate of change in its

labour productivity (assumed to be superior to S-sector productivity) plus the growth in prices of foreign goods. Price inflation in the C-sector is equal to the foreign inflation rate if the above rule is applied. The wage norm established in the C-sector spills over into wages growth throughout the economy.

The S-sector inflation rate thus equals the wage norm less its own productivity growth rate. Hence, aggregate price inflation is equal to the world inflation rate plus the difference between the productivity growth rates in the C- and S-sectors weighted by the S-sector share in total output. The domestic inflation rate can be higher than the rate of growth in foreign prices without damaging competitiveness, as long as the rate of C-sector inflation is less than or equal to the world inflation rate.

In equilibrium, nominal labour costs in the C-sector will grow at a rate equal to the "room" (the sum of the growth in world prices and the C-sector productivity). Where non-wage costs are positive (taxes, social security and other benefits extracted from the employers), nominal wages would have to grow at a lower rate. The long-run tendency is for nominal wages to absorb the room provided. However in the short run, labour costs can diverge from the permitted growth path. This disequilibrium must emanate from domestic factors.

The main features of the SM can be summarised as follows:

- the domestic currency price of C-sector output is exogenously determined by world market prices and the exchange rate;
- the surplus available for distribution between profits and wages in the C-sector is thus determined by the world inflation rate, the exchange rate and the productivity performance of industries in the C-sector;
- the wage outcome in the C-sector is spread to the S-sector industries either by design (solidarity) or through competition; and
- 4) the price of output in the S-sector is determined (usually by a mark-up) by the unit labour costs in that sector. Unit labour costs are determined by the wage outcome in the C-sector and the productivity performance in the S-sector.

The Role of Incomes Policy

An incomes policy would have to establish wage guidelines which would set national wages growth according to trends in world prices (adjusted for exchange rate changes) and productivity in the C-sector. This would help to maintain a stable level of profits in the C-sector. Whether this was an equilibrium level depends on the distribution of factor shares prevailing at the time the guidelines were first applied. Clearly, the outcomes could be different from those suggested by the model if a short-run adjustment in factor shares was required. Once a normal share of profits was achieved the guidelines could be enforced to maintain this distribution.

A major criticism of the SM as a general theory of inflation is that it ignores the demand side. Uncoordinated collective bargaining and/or significant growth in

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non-wage components of labour costs may push costs above the permitted path. Where domestic pressures create divergences from the equilibrium path of nominal wage and costs there is some rationale for pursuing a consensus based incomes policy.

An incomes policy by minimising domestic cost fluctuations faced by the exposed sector, could reduce the possibility of a C-sector profit squeeze, help maintain C-sector competitiveness, and avoid employment losses. Significant contributions to the general cost level and hence prices can originate from the actions by government. Payroll taxation, various government charges and the like may in fact be more detrimental to the exposed sector than increased wage demands from the labour market.

Flexible Exchange Rates

Although the SM was originally developed for fixed exchange rates, it can accommodate flexible exchange rates. Exchange rate movements can compensate for world price changes and local price rises. The domestic price level can be completely insulated from the world inflation rate if the exchange rate continuously appreciates (at a rate equal to the sum of the world inflation rate and C-sector productivity growth). Similarly, if local price rises occur, a stable domestic inflation rate can still be maintained if a corresponding decrease in C-sector prices occur. An appreciating exchange rate discounts the foreign price in domestic currency terms (see Mitchell 1989, p.23).

For Australia, the prices for our commodity exports are determined in world markets, and are largely invariant of our supply intentions and our domestic cost structure. Thus, higher prices, other things equal, reflect increased world demand and indicates an increased ability to compete on world markets. Exchange rate movements can change the competitive position of the C-sector because they alter the relative price of our goods compared to foreign goods. Profitability in the C-sector will thus be influenced by both unit labour cost movements (wage and productivity changes) and by exchange rate changes.

Two considerations are therefore important. First, the C-sector is not necessarily as homogenous as the simplistic SM postulates. Second, exchange rate changes do not always reflect discretionary policy adjustments, and can occur in response to world price movements.

First, the SM developed by Aukrust, classified mining and manufacturing as key industries, whereas the agricultural industry was considered to be sheltered, oriented to home production (Aukrust 1977). Agriculture and mining are the two key C-sector industries in Australia. If world demand for minerals and mineral prices rose, the SM would suggest that increased room was available to expand money wages. The government could stabilise domestic inflation by appreciating the exchange rate, but this would damage the competitiveness of the agricultural

sector whose world demand was stable (or falling). Alternatively, if the wage rises occurred in response to the increased prosperity in the mining industry (with a fixed exchange rate), the increased costs would squeeze rural profitability. Either way the C-sector industries do not all experience uniformly favourable circumstances.

Second, exchange rates for commodity exporters have historically responded sympathetically to terms of trade changes. For example, the exchange rate may appreciate in response to a terms of trade improvement, as was the case in the 1974 and 1981 mining booms, which were both accompanied by massive investment in capital infrastructure. Further, expectations of boom conditions fuelled large industry wage bargains (led by the Motor Vehicle Industry Award in 1974, and the Metal Industry Agreement in 1981). This demand-induced wages growth was then transmitted throughout the wage structure locking certain industries (for example, the rural sector), and, eventually the whole economy, into an uncompetitive position. When the world prices fell, the exchange rate had to fall by a larger amount than it had risen to maintain competitiveness. The exchange rate fall had to compensate for the fall in world prices, in addition to the rise in domestic costs due to the wage rise.

One may ask why the employers did not demand wage restraint as the dollar appreciated (as they would have under SM guidelines). The crucial point is that the exchange rate movements respond to terms of trade changes after a lag. Thus, as the terms of trade improves, the expectations of prosperity lead to industry wage bargains before the exchange rate has risen sufficiently to provide the signal that restraint is in order.

The lesson is obvious. Terms of trade changes which in the SM justify wage rises, also (in practice) stimulate sympathetic exchange rate changes. This combination locks the economy into an uncompetitive bind because of the relative fixity of nominal wages. Unless the exchange rate depreciates far enough to offset both the price fall and the wage rise, profitability in the C-sector will be squeezed.

The problem could be ameliorated through an incomes policy. Such a policy could be designed to prevent the destabilising wage movements which respond to terms of trade improvements. This conclusion is even more relevant, given that the 1974 and 1982 examples in Australia of such problematic wage bargaining occurred when formal wage guidelines were not operating. In other words, wage bargaining, consistent with the mechanisms defined by the SM may be detrimental to both the domestic inflation target and the competitiveness of the C-sector, and may need to be supplemented by a formal incomes policy to restore or retain consistency.

The SM and Fiscal Drag

The SM can also be modified to accommodate taxation. Mitchell shows that a rise in pre tax money wage inflation can lead to rising (falling) net real income depending on the marginal and average tax rate settings (Mitchell 1989). With

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sufficient tax progressivity it is impossible for the wage earners in total to generate real net income gains via money wage increases. In other words, the government is in a position to offer tax concessions in return for wages restraint, and raise the real net income of wage earners. Alternatively, the government can frustrate the real income objectives of the trade unions by manipulating the tax system.

However, this type of tax system while giving the government a powerful lever to control the wage bargaining process, might lead to excessive wage rises and in turn generate rapid domestic price inflation. Calmfors says that "a progressive tax system, stabilising though it may be from the demand side, may be very destabilising from the cost side" (Calmfors 1977, p.533).

Implications for Wage Setting in Australia

The Policy Debate

The SM predicts that movements in domestic wages and prices are largely determined by trends in international prices, subject to exchange rate fluctuations. Domestic prices (expressed in world currency terms) cannot persistently deviate from world prices. If exchange rate stability and economic growth is desired, the government must use wages restraint to influence the trend of domestic inflation.

Conversely, the exchange rate can be varied to stabilise the trend in domestic inflation (ignoring the balance of payments implications). Aukrust states that:

" ... a country that revalues by 10 per cent is virtually guaranteed over the ensuing years to experience 10 per cent less inflation than other countries, and less than it would otherwise have had. The trouble is that foreign exchange rate changes cannot always be manipulated freely, nor are they well suited as regular instruments of price policy because exchange rate changes, when they are foreseen and expected, are bound to create unwanted speculation" (Aukrust 1977, p.123).

The government could use demand restraint to insulate the domestic cost effects of applying the SM norm, although this would be very costly in terms of unemployment and future capital formation. Other options like price controls and subsidies are also problematic. The tariff debate is relevant here. Reducing tariffs can reduce the room available for wage rises as it lowers the domestic equivalent of the world price. Yet, tariff changes should reflect long term industry strategy rather than the short run exigencies of wages policy.

In the medium term, aggregate demand policy can help to moderate the incidence of wage drift over and above the SM guidelines. In reducing the domestic cost rise by restraining money wage gains, the government would be redistributing income towards the profit share in the C-sector. This point emphasises the conflict which arises between price stability goals and income distribution stability objectives. when the SM is used as a framework for wage setting.

Local industries in the sheltered sector can increase their share of national income through price rises. Wage earners in the same sector can push for wage rises in excess of the guidelines to insulate themselves from the higher domestic prices. In other words, the burden of wage and price restraint rests on the relatively small Csector industries, because the other groups can increase their shares through inflation. The SM as a framework for wage setting is therefore prone to inflationary problems and income distributional instability.

Does the Australian Economy Operate Within a SM Structure?

A basic issue is whether the Australian economy resembles a typical SM economy in structure. First, are the competitive and sheltered sector's well defined? Second, is labour productivity in the export- and import-competing industries higher than the domestic oriented industries? Third, do the SM wage setting, spillover, and domestic inflation mechanisms operate in Australia.

Despite obvious similarities, there are significant differences between the Scandinavian economies and Australia, and consequently the SM cannot adequately explain our inflationary process. It would also be a poor framework for wage setting.

On an empirical level, it is difficult to dichotomise the Australian economy clearly along SM lines. Industries like agriculture serve both the export and domestic markets and shift production between the two in response to world price trends and government marketing schemes.

It is also difficult to find any consistent productivity differences along SM lines in the Australian economy. If the mining and agricultural industries are arbitrarily classified as C-sector, and electricity, gas and water, construction, and wholesale and retail trades as sheltered industries, then Australian Bureau of Statistics (ABS) statistics indicate that no discernible (statistically significant) productivity differences exist (Australian National Accounts, Gross Product by Industry, Cat. No. 5211.0). While certain industries are clearly more productive than others, the differences cannot be consistently applied on a C-sector/S-sector basis.

These difficulties point to the informational problems which would hinder the practical use of the SM. It is one thing to specify the theoretical concept of the room for wage increases but another to agree on the actual magnitudes involved. For the SM concepts to be applicable, all parties involved in the wage determination process would have to agree on the empirical facts. The paucity of high quality and unambiguous statistical data in Australia, particularly in terms of productivity would mitigate against such a consensus. The incongruous statistical submissions which are placed before the NWC by the various parties is indicative of the difficulties which would be faced. The SM requires that all parties accept some objective source of empirical data.

Central negotiations in the Nordic countries between trade unions and the employers typically result in an annual wage contract, although in some uncommon cases a two year agreement is reached. Once the contract is formalised the parties do not seek to change the agreement during the settlement period specified. The bargaining process is in general not staggered across a wide variety of unions and employers. These institutional aspects of the wage bargaining process are similar to the Australian situation, especially when national wage fixing guidelines are administered through the NWC.

While institutional dominance characterises both systems, the manner in which the Australian institutions interact differs substantially from the pattern described above. The Swedish employer/employee groups negotiate at a peak level independent of government and an arbitration authority. Bargaining may reflect governmental goals, but essentially the outcomes reflect the relative aims of the employees and employers. The imposition of an incomes policy has been consistently rejected by the peak groups. In Australia, the pivotal role of the Arbitration Commission and industry level bargaining (with key awards transmitting wage pulses throughout the wage structure), is not replicated in the Swedish system. Also, the players in the Australian system have negotiated for lengthy periods under the auspices of defined national income policy guidelines. The SM would thus appear to have limited applicability for the Australian system.

Statistical Analysis

The following calculations provide some guide to the outcomes that could result from an application of SM wage norms. Assume that wage-setting occurs at the start of each financial year using the data at hand at June 30. The SM wage norm says that the annual growth in nominal wages equals the sum of the \$A equivalent of the growth in world prices and the growth in productivity in the C-sector. Some alternative measures of the wage norm can be constructed depending on the manner in which the C-sector is classified.

The degree to which we aggregate industries into the C-sector is rather arbitrary. Three simple classifications might be used:

- the C-sector is comprised of the Australian Standard Industrial Classification (ASIC) Divisions (A) and (B), that is agriculture and mining;
- 2) the C-sector is represented only by agriculture;
- 3) the C-sector is wholly comprised by mining.

Under these assumptions the relevant wage norm established will be referred to as wage norm-1, wage norm-2 and wage norm-3 respectively. All calculations are based on data reported for gross product at average 1979-80 prices per person employed (ABS Cat. No. 5211.0), export price indices (ABS Cat. No. 6405.0), exchange rate data (Reserve Bank Bulletin), and wage and employment data (ABS Cat. Nos. 6248.0, 6312.0 and 6302.0).

Table 1 compares the growth in actual weekly award wages, average weekly earnings and the outcomes implied by the application of wage norms -1, -2 and -3.

Table 1
Growth in Weekly Awards, Average Weekly Earnings and Wages Under Norms -1, -2 and -3
(1976-77 to 1985-86)

	Awards	AWE	Wage Norm-1	Wage Norm-2	Wage Norm-3
	13.0	12.4	18.9	4.8	10.1
1976-77	9.4	9.9	4.7	-2.0	10.3
1977-78	6.3	7.7	21.4	27.1	3.5
1978-79	9.0	9.9	11.9	6.0	5.4
1979-80	11.6	13.5	-1.1	-2.3	-0.4
1980-81		13.7	4.7	18.1	3.9
1981-82	12.3	11.2	2.1	-17.5	27.8
1982-83	11.5	8.5	29.2	45.5	-0.1
1983-84	5.2		16.1	11.3	21.4
1984-85	5.4	6.9	1.2	-6.6	10.9
1985-86	4.5	5.9	1.2	-0.0	

Figures 1, 2 and 3 graph the comparisons. The results are indicative of the problems that our wage fixing system would face under SM guidelines.

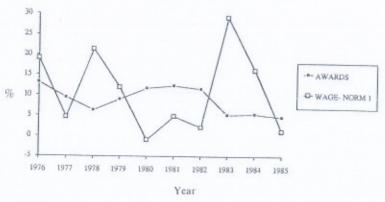
The most realistic comparison is between the growth in award wages (reflecting the arbitrated outcome under the various NWC guidelines and related industry award changes), and the wage norm-I outcome. The wage norm-I is based on the C-sector classification which includes agriculture and mining.

The C-sector productivity growth is the weighted average of the individual productivity increase in agriculture and mining. The data in Table 1 indicates the unrealistic degree of fluctuations that would result using the SM norm. The export sector in the Scandinavian economies is comprised mainly of manufacturing industries whose prices are not subject to violent annual changes. Our export sector is dominated by primary commodity producers who face large swings in their prices which are beyond their control. This is crucial to the inapplicability of the SM to Australian wage fixation.

Further, the overall average result over the period is around two per cent per annum higher than the growth in actual award wages, and one per cent higher than actual weekly earnings growth. In other words, the SM wage-norm would result in highly uncertain wage outcomes, with violent fluctuations occurring on a yearly basis, and an overall mean growth (over the period shown) in excess of the actual mean growth delivered by the process of arbitration.

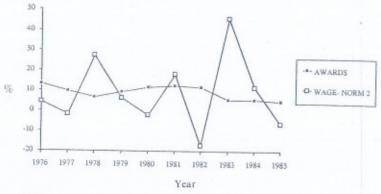
The results listed as wage norm-2 and wage norm-3 (see Figures 2 and 3), illustrate the lack of uniformity across the two export industries in terms of yearly fortunes.

Figure 1 Wages Growth under Norm-1 Guidelines Compared to Actual Awards



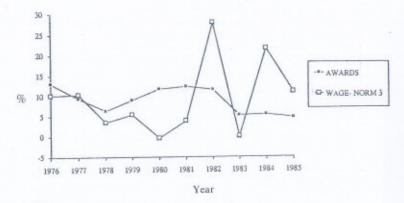
Note: Norm-1 based on agriculture and mining as C-sector,

Figure 2 Wages Growth under Norm-2 Guidelines Compared to Actual Awards



Note: Norm-2 based on agriculture as C-sector.

Figure 3 Wages Growth under Norm-3 Guidelines Compared to Actual Awards



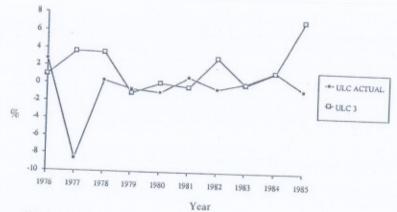
Note: Norm-3 based on mining as C-sector.

Figure 4
Agricultural ULC under Norm-1 Guidelines
Compared to Actual Awards



Note: Norm-I based on agriculture and mining as C-sector.

Figure 5 Agricultural ULC under Norm-3 Guidelines Compared to Actual Awards



Note: Norm-3 based on mining as C-sector.

Tying the C-sector room for wages growth to the movement in agricultural prices and agricultural productivity growth alone, yields the same pattern of fluctuations but a lower mean growth in wages over the period than delivered under arbitration (about 0.4 per cent lower than average award wage growth). Wage norm-3 uses the mining sector as the C-sector and results in large fluctuations and a higher mean outcome than the average growth in awards.

The important point is that the capacity to pay may rise in the agricultural sector at times when the capacity is falling in mining (and vice versa), due to the disparate movements in the individual prices faced by the individual industries. In other words, the profitability in each sector would not be uniformly protected by the SM

Figure 4 shows this affect in terms of movements in unit labour costs (ULC) implied by the wage norm-1. Actual growth in ULC are calculated as the ratio of the growth in awards to mining sector productivity, whereas ULC growth under wage norm-1 is the ratio of wage norm-1 to mining sector productivity. The results confirm the evidence previously discussed. That is, that the ULC implied by the SM wage norm would not only fluctuate violently, but would also be higher on average than the actual arbitrated outcome. Figure 5 shows the affect on mining ULC if wage increases were based on the capacity in the agricultural industry.

Tying wages growth to the performance of the mining sector exclusively (wage norm-3) would not improve the outcome, and would certainly be more detrimental to the agricultural sector (as would wage norm-2 based on agriculture's performance be harmful to mining).

Conclusion

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This study concludes that the SM would be an unsuitable basis for wage guidelines in Australia. Its use would lead to violent and uncertain fluctuations in wages growth and unit labour costs, and a higher average growth rate in wages than has actually occurred over the last decade.

In addition to the aggregate problems, the use of SM guidelines would not unambiguously maintain the competitiveness or profitability of the export and importcompeting industries. The application of the SM when agricultural prices rise (for example, in the current wool price boom), would lead to profit squeezes and impaired competitiveness in the mining industry. Any exchange rate accommodation of the improved agricultural terms of trade would further exacerbate the mining industry's plight.

One useful insight relates to the ability of government to provide "costless" real income growth through tax-wage trade-offs without impairing the profitability of the C-sector which is clearly relevant to Australia. In other words, the wage determination debate should not focus exclusively on the rate of growth in nominal wages. Rather, participants should recognise the interreltionships which exist between policy settings and wage rates.

Appendix

The SM model can be summarised by the following equations:

$$\dot{w}_{C} = \dot{p}_{W} + \dot{g}_{C}$$
 (1)

$$\dot{w}_{S} = \dot{w}_{C}$$
 (2)

$$\dot{p}_{C} = \dot{w}_{C} - \dot{g}_{C} \tag{3}$$

$$\dot{p}_{S} = \dot{w}_{S} + \dot{g}_{S} \tag{4}$$

$$\dot{p} = \alpha \dot{p}_{c} + (1-\alpha) \dot{p}_{s} \tag{5}$$

where w, p and g refer to the percentage rate of growth in money wages, prices and labour productivity, respectively. The subscripts c and s refer to the competitive and sheltered sectors described above. The weights \alpha and (1 - \alpha) indicate the relative importance of the two sectors in the economy. pw is the rate of growth in foreign goods prices that compete with domestically produced traded goods, C-sector productivity is greater than S-sector productivity.

Equation (1) describes the wage norm established in the C-sector. Equation (2) shows this norm spills over into S-sector wages growth. Equations (3) and (4) are the respective sectoral inflation rates, while (5) shows that the aggregate inflation rate is the weighted average of the sectoral inflation rates. Aggregate price inflation can be re-expressed (by substituting equations 1-4 into 5), to get:

$$\dot{p} = \dot{p}_{W} + (1-\alpha)(\dot{g}_{C} - \dot{g}_{S})$$
 (6)

Equation (6) shows that domestic inflation can be higher than world inflation without damaging competitiveness, as long as the rate of C-sector inflation be less than or equal to the world inflation rate.

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