

# ***Rural Australia: The Paradox of Plenty***

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***Issues, Options, Initiatives***

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## **Abstract**

***Australian rural policy is fundamentally misconstrued. Relying upon productivity gains will not successfully deliver desired rural outcomes***

***This argument is demonstrated by considerations in four sections***

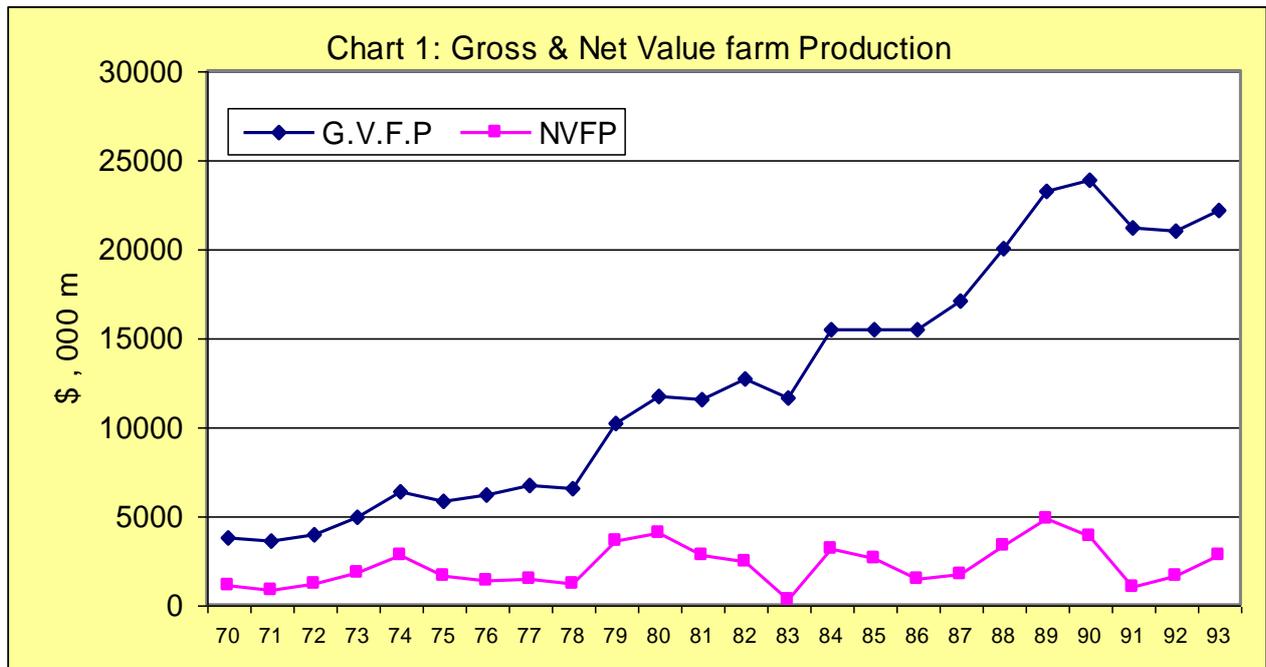
- 1 Production, returns and the terms of trade***
- 2 Rural Policy developments***
- 3 Rural performance and implications***
- 4 Conclusion***

***Past policy has failed because it did not recognize structural realignment of the rural sector in the Australian economy.***

***Given current economic dislocations and distress, both the role of rural Australia and the structure of supporting policy instruments require complete reassessment***

**Rural Australia: The Paradox of Plenty**  
**Ben Rees**

**1. Introduction**



Source: Compiled from data: A.B.A.R.E. Commodity Statistical Bulletin 1993 p. 19 <sup>i</sup>

*"the paradox of poverty in the midst of plenty"*  
*J.M. Keynes* <sup>ii</sup>

Chart 1 confirms the reality of the above quotation selected from Keynes' "General Theory of Employment Interest and Money" when applied to the fortunes of rural Australia. The graphical presentation of rural time series data demonstrates the problem referred to as the rural crisis. The curves identify gross rural production rapidly expanding over time; but the net value of rural production curve shows a declining proportion of output being retained in the rural sector. It is not difficult to understand that such long term hemorrhaging of income and wealth from the rural sector must inevitably lead to a sectoral crisis. The problems confronting rural Australia therefore are long term structural ones of a protracted nature.

Between 1951/52 and 1992/93, gross value of farm production adjusted for price movements expanded by 3% compounded annually. Rural exports grew 4.6% annual compound over the decade from 1983/84 to 1993/94. However, despite this highly productive performance real net value of farm production has contracted at the annual compound rate of 3.8% since 1951/52. Thus, by the mid 1990's rural Australia is characterized by historical debt levels, declining commodity prices in real purchasing power, rising poverty levels and, depopulation of the sector. In the mid 1990's, rural Australia is consistent with Keynes' description of unemployment in the 1930's. It is a paradox of poverty amongst plenty.

The long-term decline in the rural sector's terms of trade has been identified as the fundamental contributor to the "paradox of plenty". Nonetheless, farm and political leaders have a confused understanding of the nature and structure of the industry's terms of trade. This confusion is reflected in the following quotations.

*"Government attitudes and world trade environment were causing the declining terms of trade and deregulation had little, if any, negative impact upon farm returns."*

*Mr. Ian Macfarlane<sup>iii</sup>  
Q.G.G.A. President*

*"The sharp increase in the cost of production inputs has been the major cause of declining terms of trade faced by farmers"*

*N.F.F.<sup>iv</sup>  
"New Horizons"*

*"Australia is the world's most efficient beef producer and it is the largest exporter of beef of any of the beef producing nations in the world... No industry in Australia to my mind better illustrates the working out of the fundamental malaise of the Australian economy. And that malaise is that the high costs of doing business in Australia drag down an otherwise world class and world efficient industry... the Australian beef industry is a classic case study of the operation of those forces."*

*Hon. John Howard<sup>v</sup>*

The cause for concern in the above quotations is that they imply recognition of only one component of an industry's terms of trade, i.e. input costs. The concentration on input costs is understandable, as they comprise the difference between gross value of farm production and net value of farm production in Chart 1. However, to focus only upon costs, policy will tend to be concerned with supply side solutions to economic issues. The reality is that there are two components to an industry's terms of trade: input prices and prices received. Therefore any solution to the malaise which confronts rural Australia must embrace both sides of industry market phenomena: supply and demand.

In previous research, the task required involved a long term analysis of rural time series data. Significant factors emerged which were identified as the major influences underlying the current rural crisis. These factors which are discussed in the paper "The Rural Problem and Policy Option"<sup>vi</sup> comprised: the serious long term decline in the sector's terms of trade; decades of confused ad hoc policy development; and , failure of governments and farm leaders to recognize long term declining farm incomes as a macroeconomic structural problem. The collapse of rural commodity prices over the latter years of the 1980's and early 1990's was the catalyst to the crisis, which in some parts of Australia has been compounded by protracted drought.

The rural problem appears to have been viewed as a microeconomic structural problem within a homogeneous sector. Under economic rationalism, there emerged a view that historical over dependence upon government intervention and industry assistance had contributed substantially to the economic malaise in rural Australia. Thus, the solution to problems in the rural sector lay in improving the microeconomic structure of the sector, which would lift sectoral productivity and efficiency. It was typical modern general equilibrium microeconomic analysis of a macroeconomic problem.

By the latter part of the 1980's, Australian agricultural policy driven by neoclassical philosophy had become a lethal cocktail of market philosophy, abstract general equilibrium theory, and politics. Rural Australia was therefore exposed to political solutions to economic

problems in which either a commodity price collapse or a protracted period of adverse seasonal conditions would trigger a sectoral collapse.

Conclusions, which emerged in the previous symposium paper, canvassed a direction choice for rural Australia of either a family farm or institutional ownership structure. This paper therefore seeks to move the debate further by an analysis of the nature and structure of underlying forces, which have brought the rural sector to such a situation. This will involve development of a theoretical backdrop to terms of trade phenomena; and, an empirical discussion of rural market structures and behavior. Subsequently, populist and proposed policy solutions such as: increasing productivity, and microeconomic reform, will be examined against a loose theoretical backdrop.

## **2. Towards a Theory of Rural Industry Terms of Trade**

The purpose of this section is to explore the forces, which determine the rural sector's terms of trade; and, to provide an analytical perspective for the development of realistic rural policy. Rural industry terms of trade are defined as the ratio of prices received [Py] for output to prices paid [Pc] for inputs. This ratio can be represented over time as an index value  $Py/Pc$  in which current prices are converted to constant prices using the C.P.I. <sup>vii</sup>.

Underlying assumptions necessary for this discussion are:

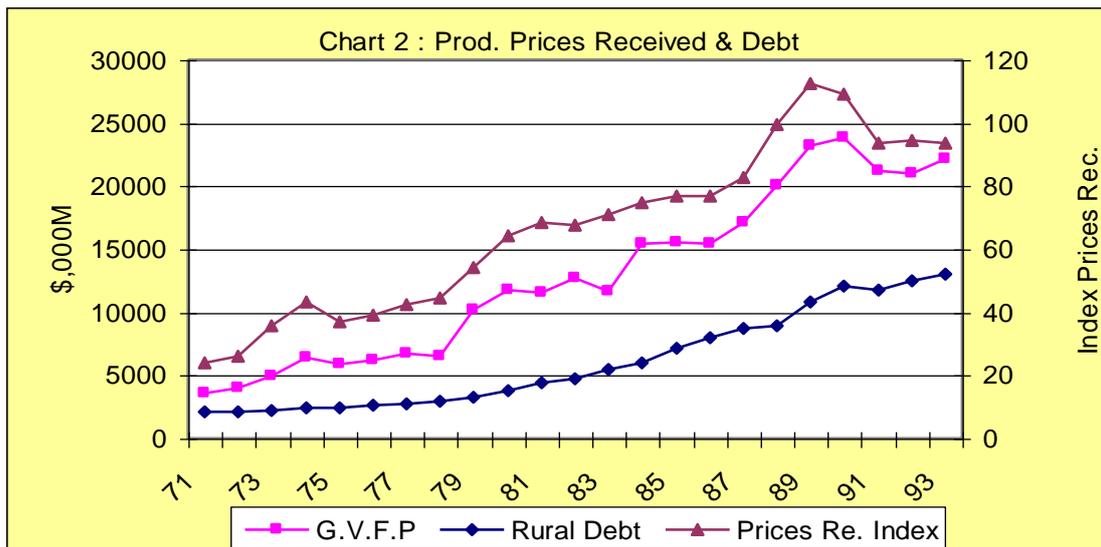
- [1] The rural sector is a non-homogeneous sector producing aggregated output represented by the market structure of a perfectly competitive industry.
- [2] Engel's Law is a valid proposition in the Australian economy.
- [3] Standard microeconomic models of market structures and behavior pertain.
- [4] International markets for agriculture are theoretically imperfect.

**Table 1**  
**Selected Rural Data**

<b><u>Year</u></b>	<b><u>Gross Value</u></b> <b><u>Farm Output</u></b> <i>\$m</i>	<b><u>Prices Received</u></b> <b><u>Index</u></b>	<b><u>Prices Paid</u></b> <b><u>Index</u></b>	<b><u>Farm</u></b> <b><u>Terms of Trade</u></b>	<b><u>CPI</u></b> <b><u>Index</u></b>
1951/52	1927	28	11	252	12
1961/62	2709	25	15	167	16
1971/72	3988	27	19	139	22
1981/82	12708	70	65	107	63
1991/92	20966	97	116	83	124
1992/93	22203	95	115	82	126

Source: A.B.A.R.E., Commodity Statistical Bulletin, p. 19, 1993

### **2.1 Prices Received**



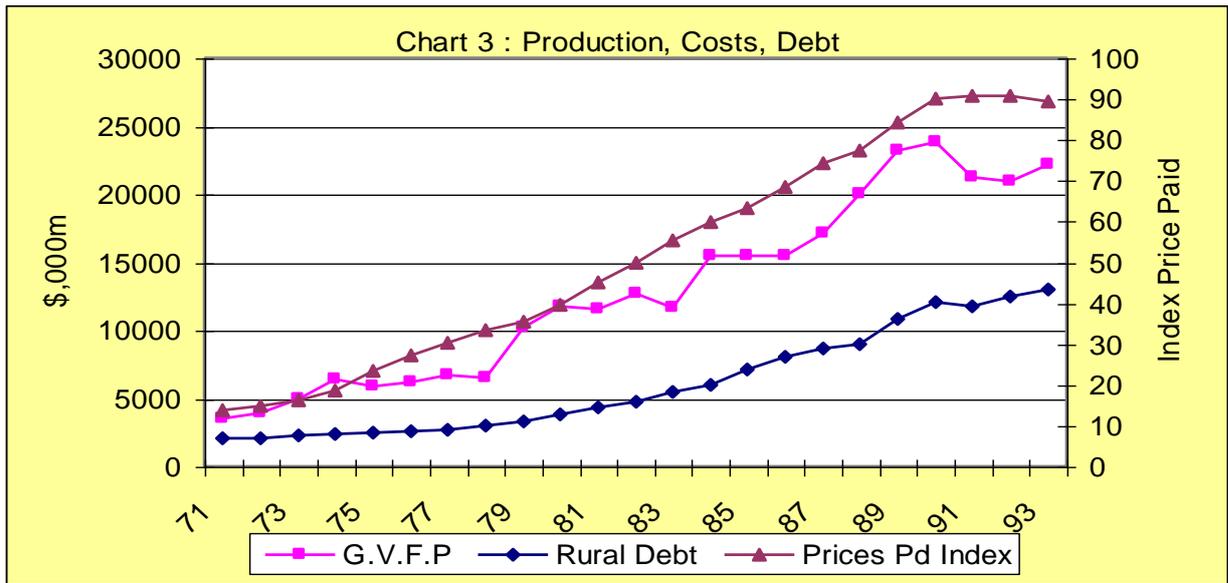
Source: Compiled from data: A.B.A.R.E. Commodity Statistical Bulletin, 1993 p. 19; R.B.A. Bulletin Dec. 94, Table C 18

Between 1951/52 and 1992/93 prices received by the farm sector increased by an annual compound rate of 3%<sup>viii</sup>. The real value of gross rural production also grew by 3% annual compound<sup>ix</sup>. Nonetheless, there have been periods of substantial movements around the long term growth rates in prices received and real output in the rural sector. For example, during the decade between 1971/72 and 1981/82, prices received rose rapidly at an annual rate of 10% compound whilst output in constant prices contracted to 1.5% annual compound. Prices in the wider community measured by the C.P.I. from Table 1 above experienced an annual growth rate of 11% compound whilst real economic growth rose by 3.3% annual compound. The rural sector experienced a decade of decline and redistribution of wealth and income to the wider community

The following decade between 1981/82 and 1991/92 represents a decade in which the real problems of sectoral decline are clearly identifiable. The C.P.I. annual compound rate of change was 7% which reflected continued inflation and redistribution occurring in the economy. However, rural prices were increasing at only 3.3% annual compound despite the surge in prices received from 1986/87 to 1988/89 when the index value of prices received rose from 85 to 112. For the decade, real gross production increased by 1.8% compound. It was a decade of price volatility, which disguised the reality of the inexorable forces at work in the economy slowly eroding the relative sectoral position of rural Australia.

The collapse of prices received from the index peak value of 112 in 1988/89 to an index value of 95 in 1990/91<sup>x</sup> represents a 7.9% annual compound decline in rural prices received over the two year period. The full significance of the price collapse on rural profitability is not fully recognized by political parties and rural industry leaders. It was the catalyst to the ensuing rural crisis which has been attributed to protracted drought across some regions of Australia.

### 2.3 Prices Paid



Source: Compiled from data: A.B.A.R.E. Statistical Bulletin 1993, p. 19  
R.B.A Bulletin Dec. 94, Table C 18

The second and no less important component of an industry's terms of trade is prices paid or input costs. Over the four decades since 1951/52 to 1992/93, farm cost increased at the annual rate of 7.6% compound<sup>xi</sup> whilst gross farm production expanded by 6.1% per annum compound. From another perspective, 1951/52 farm cost comprised 50.8% of gross farm production; but by 1992/93 the percentage was 87.9%.

The significant feature of chart 3 is the linear relationship between the three variables. The index of prices paid is almost a trend line to the gross value of production. The slope of the debt variable also suggests a linear relationship to the two variables. These relationships confirm the correlation analysis in previous research, which suggested rising cost structures led to increased production that was funded by debt finance. Over the 1980's, this scenario is evident in the graphical analysis of time series data.

The index of prices paid increased by 5.9% annual compound whilst the prices received index increased by 3% annual compound<sup>xii</sup>. The growth in the real volume of farm inputs was 1.6% annual compound, which was less than growth in real farm production of 3% per annum. Nonetheless, there was an increased use of inputs for which prices were rising faster than output prices. Some of the erosion of farm returns is explainable therefore in terms of rising input use and the faster relative increase of input prices over output prices.

It is not surprising therefore that the N.F.F. express concern over the situation of farm margins. In the discussion paper "Beating the Commodity Price Cycle"<sup>xiii</sup>, it is pointed out that farm business margins are not adequate for the generation of profit levels necessary to fund badly needed investment expenditure. They go on to suggest that a third of farms dependent upon farm income for total income are experiencing negative incomes. There are wider implications for national economic welfare and employment, which flow from the inability of the farm sector to undertake normal investment expenditure. It implies a run

down of farm establishments, farm resource, rising inefficiency in production, and a relative decline in rural living standards.

#### **2.4 Net Value: Farm Production**

**Table 2**  
**Net Value Farm Production: Selected Data**

<u>Year</u>	<u>Net Value Farm Production</u>	<u>Real Net Value Farm Production</u>
	<u>\$M</u>	<u>Index</u>
1951/52	947	216
1961/62	928	158
1963/64	1416	235
1971/72	1092	134
1973/74	2645	271
1979/80	3908	204
1980/81	2749	131
1987/88	3638	100
1988/89	4710	90
1989/90	3434	60
1990/91	1018	17
1991/92	1480	24
1992/93	2683	44

Source: Commodity Statistical Bulletin <sup>xiv</sup>

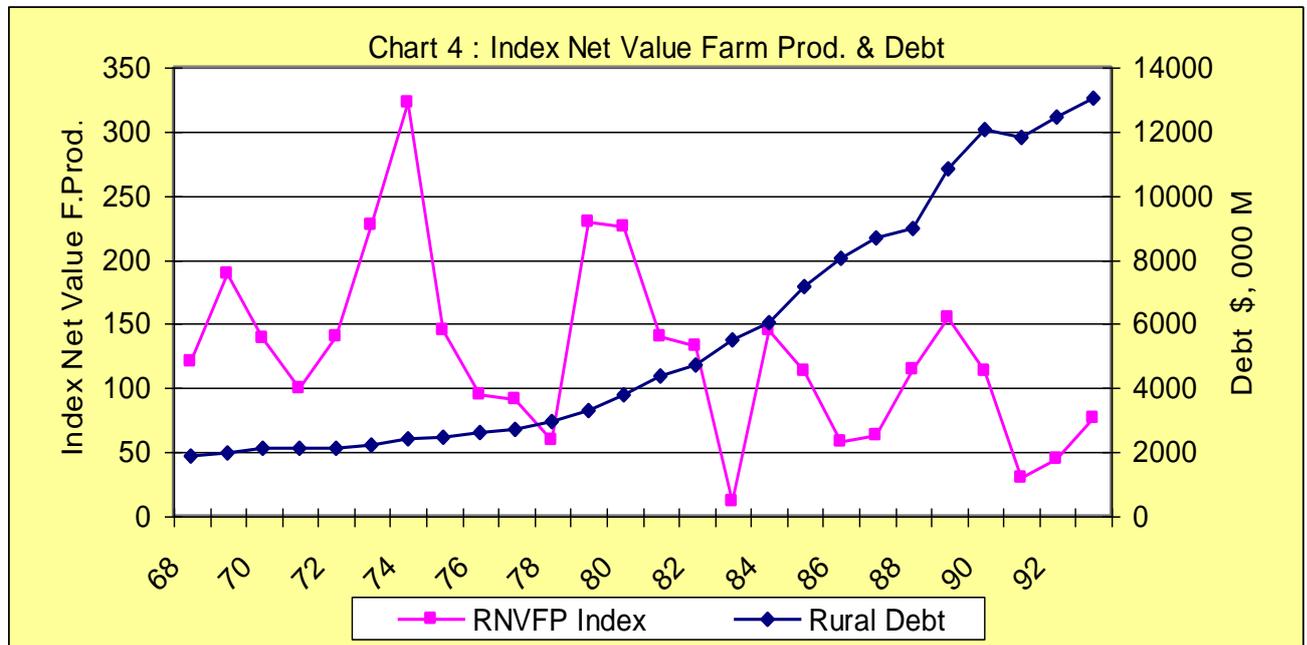
Another perspective of the rural sector decline can be illustrated through analysis of net value of farm production. Whilst real farm gross production expanded by 3% annual compound, the real net value of Farm Production Index declined by -3.8% annually between 1951/52 and 1992/93<sup>xv</sup>. The long term sectoral decline in real net value of farm production has never featured in the rural policy debate. Moreover, the long term divergence between real growth in gross farm production and real net farm production has never been considered as a factor in the rural crisis.

The real net value of farm production index has experienced substantial volatility over time due to seasonal fluctuations and price variability. Nonetheless, the historical data identifies that the rural sector enjoyed rising real income growing at the rate of 1% compound to a peak index value of 271 in 1973/74. Real net rural income was volatile; but declined steadily at the compound rate of 4.9% to compound to 1979/80.

Between 1979/80 and 1989/90, the real index value declined from 204 to 60. The rate of rural decline had begun to increase from 4.9% compound to 11.5% compound over the decade. The commodity collapse, which began in 1988/89, reached its nadir in 1990/91 with a 56.5% annual compound collapse in the real net value of farm production. The index value fell from 90 to 17 over the two year period. The drought much proclaimed by politicians and rural leaders as the cause of the rural crisis had not yet emerged.

By 1992/93, the real net value of farm production had begun to improve as the index value rose to 44. Whilst statistical analysis identifies this as a 60.9% increase in real farm production, it was from a depression base index value of 17 in 1990/91.

The relationship between real net value of farm production and rural debt is significant. From 1978 onwards, a trend line imagined through real net value of rural production produces almost a mirror reflection of the rural debt curve. In other words, as real net value of rural production declined, borrowings increased. Implicit in this relationship is that rising debt was employed to fund rising production levels. The significance of this relationship is identified in Chart 4 below.



Source; Compiled from data: A.B.A.R.E. Commodity Statistical Bulletin 1993, p. 19  
R.B.A. Bulletin Table C 18

Because net value of farm production is gross value of farm production less input costs, it can be used as an approximation of value adding in the sector for comparison with the performance of the wider economy. Between 1951/52 and 1992/93, the Australian economy as measured by the expenditure method of G.D.P. [adjusted with the C.P.I. Index from Table 1] averaged an annual compound growth rate of 4.1%. Contrast this long term expansion of the national economy with the 3.8% annual contraction of real net farm production and the macroeconomic structural decline of the rural sector is obvious.

### 3.1 A Theoretical Perspective

The failure of rural prices received and output expansion to maintain sectoral relativity in the Australian economy can be explained by reference to Engel's Law and standard microeconomic theory of industry supply and demand analysis. Engel's law was developed from an empirical analysis of budgets and expenditure patterns from a large sample of families during the nineteenth century<sup>xvi</sup>. It is one of the few economic hypotheses from the nineteenth century, which has remained valid over time.

Engle found that the income elasticity of demand for food was very low. Thus his conclusion was that the proportion of income spent by a nation on food was a good index of its economic welfare. Nations, which were well off, spent a smaller proportion of income on food than poorer nations. This infers that over time the relative expenditure on food becomes a

decreasing percentage of national income. Consequently, in a closed economy, the food producing sector must experience relative sectoral decline as an economy grows over time.

Engel's finding that food has a low income elasticity of demand is not inconsistent with the N.F.F. position in their recent paper "Beating the Commodity Price Cycle" from which the following quotation is extracted.

*"commodities have a low income elasticity of demand"*  
*Paul Brennan<sup>xvii</sup>*  
*N.F.F., June 1995*

Income-consumption curves from an economy can be used to derive Engle curves<sup>xviii</sup>. Implicit in Engel's Law are the necessary ingredients from which industry terms of trade can be explained. By combining Engel's curve phenomena with the theory of industry supply and demand, a theoretical background can be structured from which it is possible to explain the decline in the Australian rural sector and its terms of trade. It can be used also to demonstrate the inappropriateness of the favored productivity solution.

*"Since the 1950's, farmers have experienced declining terms of trade... This has meant that farmers have continually needed to increase productivity in order to remain economically viable."*<sup>xix</sup>

*Senate Inquiry*  
*Rural Adjustment, Rural Debt and Rural Reconstruction*  
*Dec. 1994*

*"Productivity levels in Australian agriculture are about 20% above comparable levels in the O.E.C.D. countries"*

*Paul Brennan<sup>xx</sup>*  
*N.F.F., June 1995*

The productivity solution to counter falling commodity prices has been promoted for over two and a half decades. It is well highlighted in the above quotations. However, considered against a theoretical perspective, the productivity solution must accelerate the decline in rural industry terms of trade. Nonetheless, for some individuals, increased productivity has achieved its promised benefits. For the rural sector however, it would have a different effect upon profitability. Increased supply would be encouraged without cognizance of the recognized low income elasticity of demand for commodities.

The theory of supply behind the productivity solution is based upon Say's Law which is implicit in the market clearing assumption that underlies general equilibrium theory and models. Inherent in the market clearing assumption is the proposition that the market clearing price will be adequate to recover production costs including a normal profit. Recent experiences of the major rural industries are real world examples of the invalidity of the market clearing assumption. The fallacious nature of the market clearing assumption is clearly evident in the following quotation.

*"Rising productivity lowers the unit costs of production and in competitive markets this lower cost will be reflected in lower prices. The business margin is unchanged"*

*Paul Brennan<sup>xxi</sup>*  
*N.F.F.*

In the real world, the optimum price for an industry product is determined when supply and demand are in equilibrium. Because the income elasticity of food is inelastic, any productivity improvement that expands output beyond equilibrium output means that price will fall by more than the percentage increase in output. In other words, stability in food prices is determined by the rate of growth in food demand. Therefore, growth in food production above the rate of growth in domestic demand becomes self defeating in a closed economy.

In an open economy such as Australia, product surplus to domestic demand must be exported into imperfect international markets. International markets for agriculture are imperfect because other national governments seek to support their own rural sectors. Indeed, over the 1980's, the level of producer subsidies increased in excess of twofold in the E.U., Japan, and the U.S.A<sup>xxii</sup>.

Great hopes have been placed in the Uruguay G.A.T.T. round which has sought to reduce farm support programs; but, the negotiated reduction in agricultural support will leave the major players enjoying higher protection than they had in the early 1980's. Moreover, enabling legislation for U.S. compliance to the Uruguay round allows the use of subsidies for new market development<sup>xxiii</sup>. Thus the enthusiasm for G.A.T.T. might prove to be a hollow victory over time as there is every opportunity for the U.S. to move from market support subsidies to market development subsidies. Recent media discussion on potential American wheat sales to new Asian markets is an example of the hollowness of the G.A.T.T. "victory".

The long term annual rate of growth in the international food supply for the two decades up to the end of the 1970's was 2.6%<sup>xxiv</sup>. Since 1983, the I.M.F. estimates that the supply of commodities has almost doubled<sup>xxv</sup>. Such an expansion of commodity production would require a growth in supply approximating 6% annual compound. Empirical analysis suggests therefore that international supply has expanded in excess of world demand. In terms of market theory such a situation is unstable and the implication for prices must be negative until there emerges a more appropriate relationship between international supply and demand.

### **3.2 Output Markets**

The influence of market structures on agricultural prices and the opportunity to exercise market power is a question worthy of urgent research. Agriculture is generally recognized to approximate theoretical perfect competition. This market structure assumes a large number of sellers and buyers operating in the market none of whom can individually influence the industry price which is determined in the market place. The demand side of agricultural markets however does not comprise a large number of buyers whose individual influence on price is unimportant.

For example consider the cattle industry. The supply side of the market comprises a large number of producers. The demand side of the market represented by the meat processing sector has become highly concentrated over the past decade. In 1987/88, the four largest processors employed 24% of the labor force in that sector and processed 27% of output. By 1991/92 the four largest processors employed 40% of the labor force and processed 60% of industry output<sup>xxvi</sup>. This is an example of an industry in which ownership and control is highly concentrated and therefore opportunities for exercising market power to advantage the processing sector. A most frightening aspect is that when industry productivity analysis was modeled by A.B.A.R.E., the meat processing sector was assumed to be a perfectly

competitive industry<sup>xxvii</sup>. The whole approach to industry analysis and policy development for agriculture is more suggestive of a Hollywood cartoon than real world requirements of policy development.

The demand side of agricultural markets are more recognizable as oligopsonies i.e. small number of large buyers. The major rural commodities of wool, meat and grain are sold into markets both domestically and internationally in which market power is highly concentrated. The markets for agricultural output are therefore hybrid market forms in which sellers are perfectly competitive but buyers are oligopsonies. Market power in these hybrid market forms is demonstrably unequal. Thus price outcomes are open to the pursuit of self-interests of the more powerful market players.

To stabilize rural income flows, there is an urgent need to rethink the way in which prices received are determined for rural output. Some mechanism which will provide countervailing power to the weaker supply side players has to be given serious policy consideration. Furthermore, problems of agricultural pricing and production inferred from Engel's Law and the theory of supply and demand suggest that continued reliance upon market economics can not return stability to the rural sector. For the survival of family farming, this will become a critical policy issue. On the other hand, if institutional farming becomes the dominant industry structure, rural production will be funded by profits gathered at the point of retail pricing and redistributed within the vertically integrated institution. Industry terms of trade decline will become then an academic discussion topic rather than an industry policy question.

In the end consumers will be required to pay a realistic price for food irrespective of the chosen industry structure. The difference will be the method by which prices are determined and the way in which the redistribution from consumers to producers is effected i.e. exercising of market power or government intervention.

### **3.3 Input Markets**

The most important input cost used in agriculture are chemicals, fertilizers, fuel, finance, seed and fodder. The industry structures of these important inputs are ones in which ownership and control of the production base are highly concentrated. They are oligopolies. Oligopolies have pricing systems that have confused microeconomic theorists for some six decades. Nonetheless, whatever the theory of the firm favored to explain the market behavior of oligopolistic firms, there is no question that such industry structures lend themselves to the exertion of market power in their pricing policies. Agricultural producers have little bargaining power in the pricing of inputs into their operations.

The markets for major agricultural inputs are once again hybrid structures. On the demand side there are the perfectly competitive characteristics of the farm sector. On the supply side are the characteristics of oligopolies. The question of policy formulated for the rural sector assuming competitive market structures is therefore a feature of ideology rather than fact. There is an urgent need for economic research to determine the level of market power exercised against agricultural producers and its effect upon the erosion of the rural terms of trade. It would provide also the basis for determining the most appropriate policy instruments required to stabilize the sector.

**4. Advocated Solutions: An Appraisal**

What emerges in this discussion is a sector for which data is available; but for which little attempt at serious analysis has been undertaken. Instead there is continued paralysis of policy initiative and focus which maintains a course of pursuing "more of the same". It is a policy direction based upon a blind faith in productivity improvement and microeconomic reform.

*"improve productivity by removing impediments that reduce the competitive strengths of farmers and the linkages to industries which service agriculture.....Pursuit of policies that improved the cost structure of Australian industry could have significant benefits for farmers"*

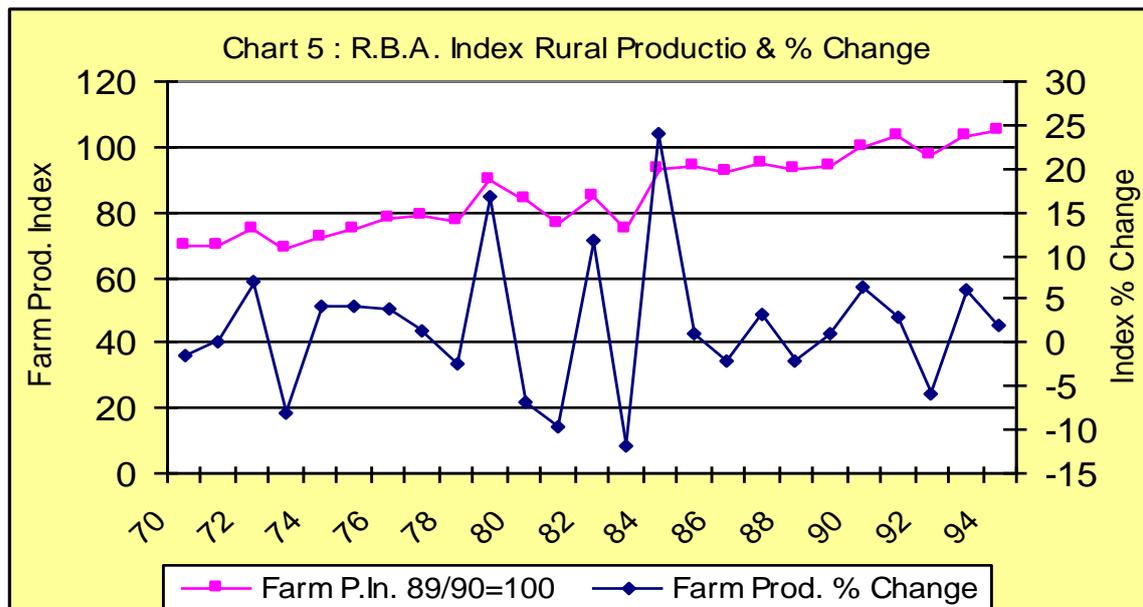
*"Beating the Commodity Price Cycle" <sup>xxviii</sup>*

*"Reform other sectors of the Australian economy to reduce off-farm costs [and] Implement policy initiatives aimed at improving our international competitiveness"*

*Towards 2000: Issues and Challenges Facing the Cattle Industry Today <sup>xxix</sup>*

**4.1 Productivity V Factor Reallocation**

Serious questions have been raised over the productivity solution. Given the theoretical perspective developed from Engel’s Law and standard industry theory of supply and demand, the productivity solution should never have been entertained as a serious answer to the structural problems which have confronted the rural sector over the past two and a half decades. Chart 5 demonstrates empirically the wide volatility of the rate of change in real production and hence in itself questions productivity performance claims made by industry spokesmen.



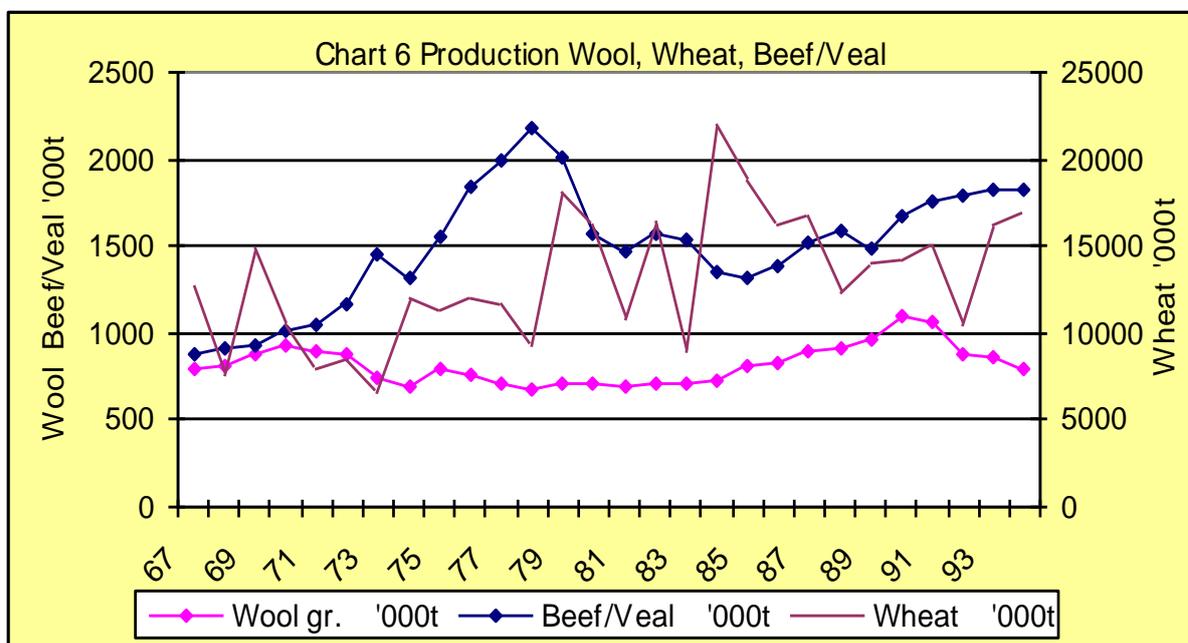
Source ; Compiled from data: R.B.A. Bulletin Dec. 94, Table G 8

The N.F.F. use Total Factor Productivity [TFP] as their measure of productivity performance which is the ratio of change in the index of gross farm production to the index of inputs. The index comprises labor, capital and intermediate goods and services used in production as a

result of technological change<sup>xxx</sup>. This definition is questionable on the grounds that it is open to confusion with factor substitution of capital for labor promoting factor growth in capital. Increased output then becomes the result of capital growth rather than productivity improvement.

Moreover, the factor land is not identified in the model which means that the contribution of the major rural factor endowment is assumed constant. Thus any factor expansion in agricultural land from development of virgin country is excluded as it is the impact of increased output from agricultural activity in marginal land made possible through technological advances in plant species, fertilizers, and farming techniques. For development of rural policy, the assumption that the contribution of the factor land is constant is unacceptable and defies reality.

For example, the volatility of the rate of change over the decade to 1991 casts doubt on the claim that the average productivity growth was 3% per annum<sup>xxxii</sup> or 2.8% between 1981/82 and 1992/93<sup>xxxiii</sup>. Calculated productivity would be influenced substantially by the actual years selected for observation and the appropriation of the factor land to particular industry activity.



Source; Compiled from data: R.B.A. Bulletin Dec. 94, Table G 8

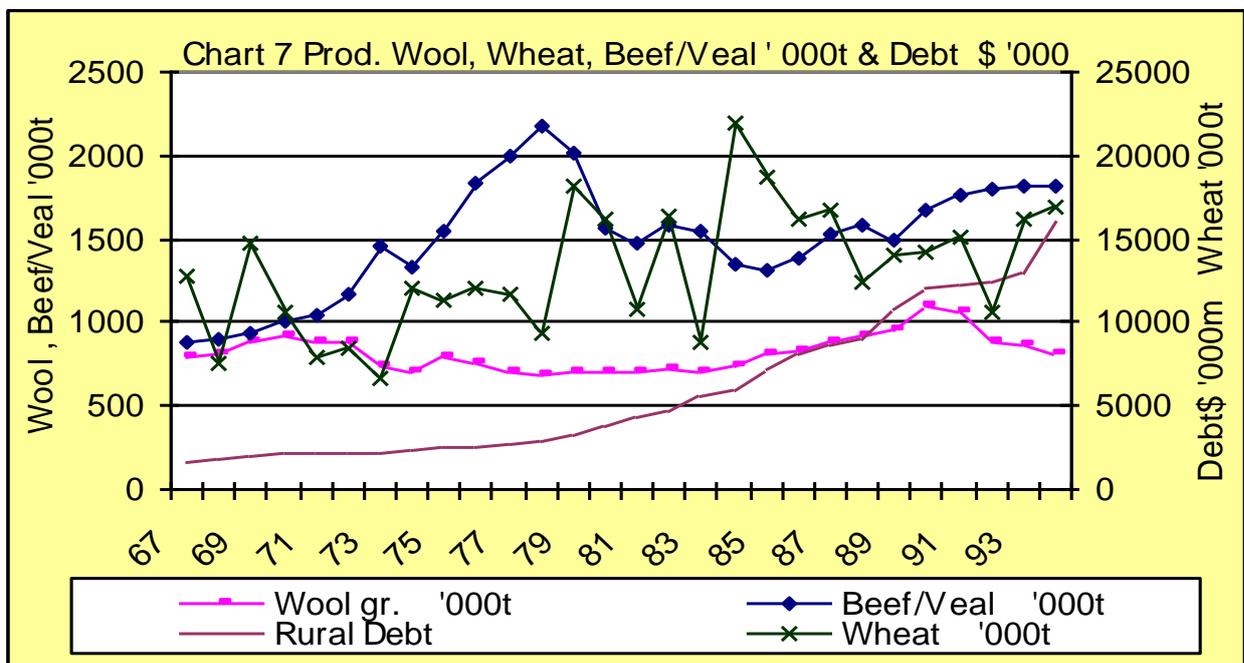
Chart 6 provides a visual presentation of production performance for the three major rural industries: wool, wheat, beef and veal. Factor movement between industries provides a realistic explanation of rural production behavior patterns as producers respond to industry dislocation and profit opportunities available in alternative industries. For example, both wheat and wool industries experienced demand contraction over the late 1960's and early 1970's. A subsidy was paid to wool producers to compensate for low wool prices whilst the wheat industry accepted quotas in the early 1970's. Movement of production from wheat and wool to beef and veal production is identified from 1969/70 to 1973/74. The growth in beef and veal production cannot be explained as productivity improvement. It had to be the result of factor transfer from the industries in decline to the perceived prosperity in beef and veal

production with saleyard prices for beef rising from 62c to 80.7c a kg between 1972 and 1973<sup>xxxiii</sup>

The result of the collapse in beef saleyard prices over 1974/75 to 30.4c a kg brought about a dramatic increase in beef and veal production through to 1978 when saleyard prices reached 65.8c a kg. This was a period of severe dislocation in the beef industry in which producers were paid to slaughter unsaleable animals. Thus the high level of production over this period represents beef and veal producers moving out of cattle into wheat production. Factor endowments are transferred from one industry to the other. The expansion of the wheat industry is clearly visible on Chart 6 between 1973 and 1984.

The traditional relationship between wheat and wool re-asserts itself from the mid 1980's. Wool prices rose and encouraged increasing wool production from 1983/84 to peak in 1990. From 1984/85, factor transfer is visible from wheat to wool and beef production as beef and wool prices became attractive to rural producers. However, the sharp increase in wool production from 1989/91 was a miniature re-run of the cattle crisis of the 1970's. Price instability over the late 1980's led to the abandonment of the wool reserve price system over 1989/90. Wool production was so unprofitable that producers were paid to slaughter unwanted animals. Thus the peak in wool production between 1989/1991 represents producers moving from wool to release the factors land and capital for transfer to wheat, and beef and veal production.

Implicit in the microeconomic reform and productivity agenda is factor substitution of capital for labor through technological advance. In this case, factor growth results from technological advances being converted to capital on application to the production process. Graphical evidence in Chart 6 supports the concept of factor movement of land between industries. Thus, the large increases in production coinciding with events occurring in other rural industries is suggestive of industry factor expansion in land and capital rather than a simplistic substitution of capital for labor.

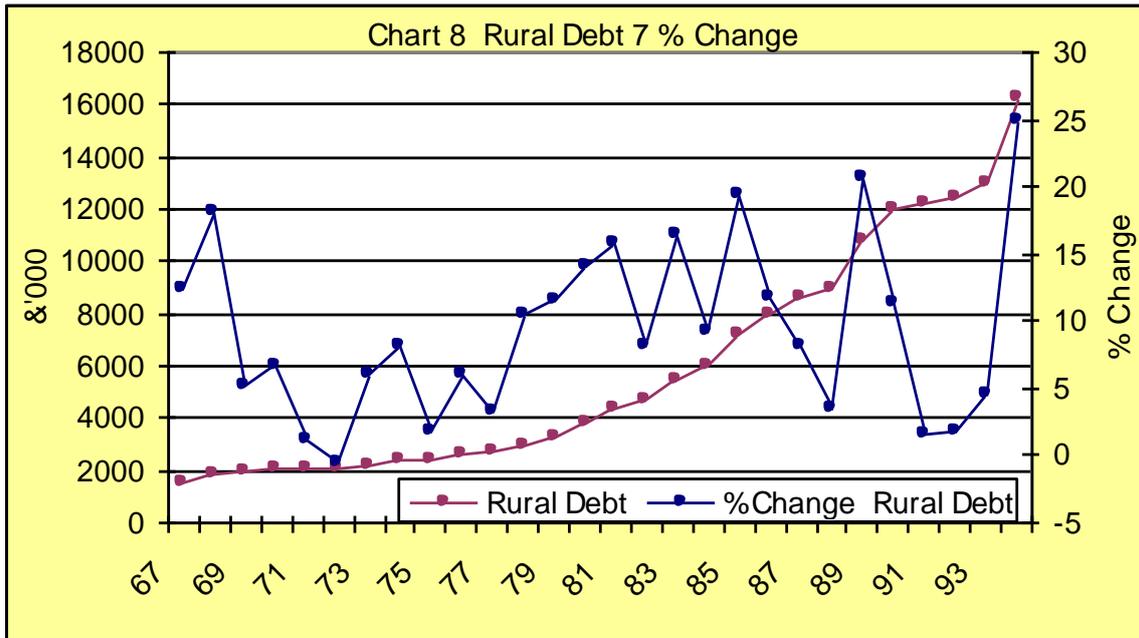


Source: Compiled from data: R.B.A. Bulletin Dec. 94, Tables C 18 & G 8

By overlaying rural debt on Chart 6 to create Chart 7, the factor transfer, factor growth thesis is supported by empirical evidence of debt financed production moving from one industry to another. Movement of production between industries provides a realistic explanation of the current historic level of debt and its protracted accumulation. For example, the debt curve begins to increase its gradient during the cattle crisis of the 1970's which is consistent with factor transfer from beef and veal production to wheat growing. The movement from wool production during this period would also lead to factor transfer from wool to wheat growing.

The rapid escalation of debt from 1977/78 onward coincides with increasing movement from beef and veal production to wheat growing. Once again in 1984 there is an increasing incidence of debt accumulation which coincides with a factor restructuring from wheat to wool; and, in 1985 to beef and veal production. In 1988 there is another increase in the gradient of the debt curve which coincides with rising beef and veal production. From 1991, debt increases again consistent with a movement from wool production to beef and veal production.

Chart 8 comprises the rate of change in rural debt super imposed over the level of debt curve. The volatility of borrowing behavior represented by rates of change coincides with changes in the gradient of the debt curve. Moreover, an imaginary trend curve through the rate of change curve from 1974 onwards implies that the rural sector never fully recovered from the cattle crisis of that period. The oscillations around the imaginary trend curve becomes wider and wider from 1984 onwards suggesting increasing sectoral instability. The current rural crisis had been building for almost a decade.



Source: Compiled from R.B.A. Statistical Bulletin Dec. 94 Table C 18  
R.B.A. Statistical Bulletin Financial Supplement March 1981 p. 115

The intra industry cyclical movement of factor endowments appears on average to be around eight years. The apparent cyclical phenomena would be in response to terms of trade or cost/price squeeze impacting upon particular industries unequally over time within the rural sector. Indeed, the increasingly wide oscillations in the rate of change curve in Chart 8 from

1984 onwards coincide with the growing acceptance of economic rationalism and market economics. It provides an uncomfortable challenge to the proponents of free market economics and claims of long term economic stability and growth inherent in their theoretical models.

The role of the Rural Adjustment Scheme would have been to assist factor transfer and factor expansion. The contribution of a rural adjustment scheme would be destabilizing. Indeed, the move from rural reconstruction to rural adjustment does not appear to have been a stabilizing influence. Chart 8 identifies the period from 1977/78 onwards as one of increasing dependence on debt finance which implies growing sectoral instability.

The solution to the problems confronting the rural sector lies not in factor expansion but in factor stabilization through periods of cyclical instability. This will require an approach very different to rural adjustment and market economics.

#### **4.2 Microeconomic Reform**

Microeconomic reform is a fundamental tenant of the current economic debate. Economic models abound which purport to demonstrate that microeconomic reform will restructure supply side impediments and improve productivity thereby achieving a long term sustainable growth rate. E.P.A.C.; B.C.A.; and, the I.C. are examples of influential organizations and institutions involved in economic modeling espousing the merits of microeconomic reform of the Australian economy. Influential models used include the I.C.'s Orani Model and Access Economic Murphy family models [AEM]. These models are computable general equilibrium models<sup>xxxiv</sup>.

The data bases from these models are used widely by industry groups. For example, the N.F.F.'s "Beating the Commodity Price Cycle" references the EPAC Background paper No. 38 and the BCA's "Achieving Australia 2010"<sup>xxxv</sup> [AEM family models] when arguing the benefits of microeconomic reform to the rural sector. However to use general equilibrium models for agricultural policy formulation strains credibility. They are subject to the same criticism leveled by Keynes against economic theory of his day. Nonetheless its use in agricultural policy formation is the concern in this discussion.

*"Our criticism of the accepted classical theory of economics has consisted not so much in finding the logical flaws in its analysis as in pointing out that its tacit assumptions are seldom or never satisfied, with the result that it cannot solve the economic problems of the actual world"*

*J.M. Keynes<sup>xxxvi</sup>*

The computable general equilibrium models Orani and the AEM family show long run equilibrium positions in which all markets clear and producers optimize behavior<sup>xxxvii</sup>. Implicit in the market clearing assumptions is Say's Law which states that production of goods by economic units creates income which is in turn expended to buy products produced by others. In other words, supply creates demand. The notion that supply creates demand dates back to the late eighteenth and early nineteenth century i.e. the time of Say and Ricardo<sup>xxxviii</sup>.

For validation of the underlying assumption that all markets clear, a certain relationship between the supply and demand curves must exist. Keynes explained the necessary relationship between the supply and demand schedules to validate Say's Law as follows:

*That "Supply creates its own demand continues to underlay all orthodox economic theory involves a special assumption as the relationship between these two functions... the classical theory assumes, in other words, that the aggregate demand price [or proceeds] always accommodates itself to the aggregate supply price;"*

*J.M. Keynes<sup>xxix</sup>*

Keynes was saying that whatever the value or level of aggregate demand produced by a given level of employment, it is assumed that it will always accommodate itself to the value or level of supply. This is a fundamental underlying concept which still dominates the economic agenda in Australia moving into the twenty-first century. The full implication is also consistent with the microeconomic reform and productivity agenda because it implies that the level of demand in the economy does not have some finite value; but has an infinite range of values. The level of employment it follows must be indeterminate also except that the marginal product of labor sets an upper ceiling<sup>xi</sup>. Whilst contemporary economists would most probably disassociate themselves with the notion of Say's Law, as long as the market clearing assumption is employed in economic modeling any rejection of the eighteenth century economic theory is little more than hollow rhetoric.

Under the market clearing assumption there can never occur such phenomena as market failure or demand collapse. The reality of Engles Law and accepted economic theory of supply and demand becomes irrelevant. Low income elasticity of demand for commodities recognized in the N.F.F. "Beating the Commodity Price Cycle" is also inconsistent with Say's Law. Nonetheless, in the EPAC Background paper No. 38 general equilibrium modeling accepts that prices could fall because improved productivity performance from microeconomic reform will permit "substantial price reductions"<sup>xli</sup>. This is clearly a very different situation to market failure experienced periodically by agricultural industries and in recent history by both the wool and beef industries.

Contemporary economic policy complies with the tenants and principles of Say's Law. For example, because there cannot be a deficiency of demand, it follows that spending creates demand for consumption goods and savings creates demand for investment goods<sup>xlii</sup>. Thus the real world situation that investment decisions are made by business enterprises and public institutions and not thrifty housewives is beside the point under Say's Law. However, policy direction becomes based upon the simplistic notion that measures to encourage national savings by discouraging consumption will return the nation to prosperity. The economic management task then is to remove impediments to market forces through microeconomic reform which will allow market mechanisms to function automatically.

A further assumption in the general equilibrium modeling used in both Orani and the AEM family of models is that there is a complete adjustment of capital to optimum levels. This assumption sits uncomfortably with the claim in "Beating the Commodity Price Cycle" that at current levels farm business margins are inadequate for financing new investment<sup>xliii</sup>.

In the long run, general equilibrium modeling assumes that the economy will adjust to an equilibrium position in which economic agents will have no incentive to deviate from their perceived optimal long run behavior<sup>xliv</sup>. This assumption immediately introduces a

contradiction. Either future time collapses into today or every individual has perfect knowledge of the behavior of every other person whilst they hold the same knowledge about the first individual<sup>xlv</sup>. This is of course the famous debating point of reaching a stationary state or in economic rationalist terms "long term sustainable growth". The question unanswered by the stationary state hypothesis is the achieved long term rate of growth and its capacity to absorb all school leavers and those who want employment. These problems are not addressed because they are assumed away by the underlying assumption of full employment output at equilibrium point or "stationary state" conditions. More to the point of reality is the question of the rural sector under this fictional state of "Bliss"?

Tariff reforms are calculated to deliver 0.8% gain to G.D.P.<sup>xlvi</sup>. Adjustments by producers and consumers to relative price changes as the economy becomes more open under lower tariff levels is the basis of delivering economic growth. The underlying assumptions for such claims need to be questioned. They are not always valid. Arguments for and against tariffs are subtle and varied. There are limits to the case for free trade and those limits should be recognized<sup>xlvii</sup>.

Moreover, the EPAC Paper does not identify the purpose of a tariff, i.e. revenue function or industrial policy. In other words, it is assumed as an indirect taxation instrument, a tariff has no role in government revenue policy. Moreover, there are no terms of trade effects which will improve the current account; and, contribute to an industry policy which promotes industrial development and employment in Australia. In other words the general equilibrium model does not recognize the income distributional consequences of removing tariffs except at the abstract sectional industry level within the narrow parameters of consumers and producers.

Tariff analysis within a general equilibrium model is undermined by the underlying assumption of reaching the long-term optimum general equilibrium output from which there is no incentive to move. This presupposes a set of markets which are perfectly competitive in which no consumer or producer can influence production or pricing. Concentration levels in Australian industry dismiss this unrealistic assumption. Examples of imperfect markets abound in the Australian economy. Major examples of industries operating in markets which would permit exercising of market power include: banking, retail and wholesale trade, insurance, pastoral houses, transport, media, communications, shipping, meat processing, wool buying, grain marketing. Clearly, any real world contributions to G.D.P. are likely to be very different to those calculated under general equilibrium modeling based upon assumptions that "do not approximate the real world". Similarly, policy developed from such modeling should be considered as obtaining to an unreal world and therefore only a guide in the process of policy formation.

Finally the productivity calculations obtained from computable general equilibrium modeling are imputed as inputs into a dynamic macroeconomic general equilibrium model. EPAC use the AEM macroeconomic model into which they impute the results of the AEM-CGE model<sup>xlviii</sup>. Given the questionable structure of general equilibrium modeling discussed above, the reliability of any macroeconomic calculations will be determined by the acceptability of the underlying assumptions of the primary CGE modeling. Thus macroeconomic policy formulated from general equilibrium modeling will have as its basis Say's Law and the inherent assumption that the market clearing price will be adequate to recover production costs. The experience of the rural sector discussed in this paper would suggest that the market clearing assumption is a sad reflection of dogma out of control.

## 5. Summary and Conclusions

### 5.1 Summary

The long term decline in the rural sector's terms of trade is only just being recognized as a serious policy issue in Australia. Failure to understand the nature and impact of the phenomena upon the fortunes of Rural Australia has allowed a situation to develop in which long term agricultural output has grown by 3% annual compound; but, the real net value of farm production has contracted by 3.8% annual compound. Thus, approaching the twenty-first century, rural Australia has all the characteristics which led Keynes to describe unemployment in the Great Depression as a "paradox of poverty in the midst of plenty".

Strong long term production performance of the sector can be demonstrated statistically to meet both domestic and export demand for commodities; and yet, the percentage of production retained by the rural sector has declined from 49.1% in 1951/52 to 12.1% in 1992/93. This erosion of production from the sector represents income and wealth flowing to the wider community. It is the cause of sectoral decline and the escalation of debt, poverty, structural dislocation, and despair which has come to characterize rural Australia.

The mechanism by which rural output flows to the wider community is described as the industry terms of trade. It is the ratio of prices received for output to prices paid for inputs into the production process. Both components of the terms of trade lie beyond the control of the rural sector. Prices received for output are determined in imperfect market structures which are governed by international commodity prices determined in corrupted international markets. Prices paid are formulated in a different set of markets which comprise, oligopolies, monopolistic competition and monopolies. In both cases rural producers are price takers and therefore exposed to market environments in which market power is distributed unequally.

Theoretically rural industry terms of trade can be explained by combining Engel's Law with standard theory of supply and demand. Engel's Law explains the structural impact of changing patterns of consumer behavior in an economy as it matures. Supply and demand theory explains the influence of supply and demand forces upon price at various levels of production. Theoretically, these two phenomena make it possible to explain both the relative decline of the rural sector over time; and at the same time, provide the framework for development of realistic agricultural policy necessary to integrate the sector into the wider economy.

Engel's Law states that as incomes rise, a decreasing budget allocation flows to the purchase of food. In other words food has a low income elasticity of demand. Consequently as an economy matures over time the food producing sector must decline in relative importance within the economy. In the recent publication "Beating the Commodity Price Cycle", the N.F.F. confirms Engel's nineteenth century finding by stating that commodities have a low income elasticity of demand; but, the structural impact of this phenomena is not discussed.

Standard theory of supply and demand explains price determination relative to the operation of market forces. There exists an optimum price level determined in the market when supply and demand are in equilibrium. Because of the low income elasticity of demand for commodities, if production expands beyond the equilibrium level of output, price must fall by a larger percentage than the growth in output. In an open economy such as Australia, product

surplus to domestic demand is exported. However, international prices are determined similarly by the theory of supply and demand as it applies to international trade in markets for agricultural commodities which are recognized as distorted by the agricultural industry policies of other nations.

Theoretical analysis of the rural sector raises the question of policy development to stabilize the sector over time and maintain the relative living standard of rural communities under long term sectoral realignment within the Australian economy. A second and no less important question is to coordinate rural policy to accommodate the sustainability of the resource base of the sector more popularly recognized as sustainable agriculture. Both policy objectives depend upon maintaining a viable and profitable industrial base within the rural sector.

Past rural policy has not recognized the structural nature of the long term decline in the sector's terms of trade. Income decline has been recognized; but, not its real significance. Previous agricultural policy sought to counter falling farm incomes by encouraging improved rural productivity. It has been a simplistic mathematical solution which believed that increasing units of output times falling unit price equals income maintenance and or rising income.

With the rise of economic rationalism during the 1980's, the productivity solution gained theoretical respectability. Efficiency criteria under neoclassical general equilibrium theory required that the marginal rate of substitution in consumption equaled the marginal rate of transformation in production across the economy to achieve the desired Pareto optimality. For example if the marginal value product of labor does not equal the marginal cost of labor in the rural sector, then inefficient resource allocation is theoretically demonstrated. Given such market identification of resource misallocation, it follows that the sector is considered inefficient and uncompetitive.

If all markets are operating freely, then Pareto optimality should emerge. The sectoral dislocation evident in the rural sector identifies theoretically that rural markets are imperfect in structure and that the marginal cost of factor inputs is in disequilibrium with their marginal value products. The solution lies in economic policy pursuing market reform to remove market impediments. Hence the preoccupation with the microeconomic reform agenda in the rural policy debate; and also, its role in the national economic debate.

By restructuring the economy to remove market impediments the automatic adjustment process of general equilibrium theory is allowed to function and return the economy to prosperity. Central to the microeconomic thesis is the productivity solution which flows from market restructuring. Rural policy under economic rationalism and general equilibrium modeling has embraced the productivity solution with enthusiasm. "Rising productivity lowers the unit costs of production and in competitive markets this lower cost will be reflected in lower prices. The business margin is unchanged" <sup>xlix</sup>.

In abstract general equilibrium economic models, productivity has no upper limit under the assumption that all markets clear at equilibrium output. The full implication of this proposition is that prices have no base beyond which they cannot fall provided productivity can be increased. The question which enthusiasts of microeconomic reform and the productivity solution must answer is therefore what happens at zero or negative prices for output? Implicit in this question is the explanation of rural policy failure and the development of the rural crisis.

This paper challenges rural productivity claims. Empirical analysis of output performances of the major rural industries: wool, wheat, beef and veal suggest that factor movement between industries and factor growth in both land and capital provides a more credible long term explanation of growth in rural production. This does not deny that productivity improvements have contributed to rural output growth; but, it suggests that productivity claims are open to question as being confused, to some extent, with factor transfers to more intense farming industries and factor expansion over time particularly as technology converts to on farm capital factor expansion.

Moreover, empirical analysis of debt accumulation and debt rates of change support the factor movement and factor expansion proposition. Debt escalation coincides with factor movement between the major rural industries. As an industry experiences terms of trade downturn, producers move to an alternative major industry offering an improved terms of trade environment. These intra-industry factor movements exhibit business cycle characteristics with an approximate eight year cycle pattern evident since the beef crisis of the 1970's. The implication is that the rural sector has never fully recovered from the severe dislocation associated with the beef collapse beginning in 1974.

Economic modeling which purports to demonstrate gains to rural output and incomes through microeconomic reform and subsequent productivity gains is challenged. Economic models used are general equilibrium models structured upon assumptions that do not reflect reality. Consequently it is argued that these models are unable to offer solutions to economic problems of the real world and in particular problems confronting rural Australia. For example, the general equilibrium models which purports to demonstrate productivity gains from microeconomic reform recognize only two factor inputs i.e. capital and labor combined with the other inputs. Therefore, the contribution of the major factor input for the rural sector is assumed constant. Projections from models which ignore the major rural factor endowment land cannot be taken seriously. Moreover, to use only two factor inputs capital and labor must produce projections which are based upon factor substitution of capital for labor. Hence, any productivity projections are open to question on the grounds of factor growth being confused for productivity gains.

The major assumption used in general equilibrium modeling of markets clearing at long run equilibrium output is challenged on the same grounds that Keynes rejected general equilibrium theory in the 1930's. This assumption implicitly contains the late eighteenth century Say's Law which states that supply creates demand. It also contains the proposition that the market clearing price will recover costs and include a normal profit. It is a particularly important assumption because from it flows the unrealistic proposition that there can never occur a failure of demand. Thus, there can be unlimited production or supply which will always sell without economic loss at whatever price clears the market.

From the market clearing assumption flows all the theoretical structure to establish the validity of the microeconomic reform agenda and the productivity solution. If the markets do not clear, then there exist market impediments which prevent the free flow of market forces. These impediments create bottleneck situations which reflect inefficient resource allocation. The solution therefore is to pursue microeconomic reform thereby removing market impediments allowing the automatic adjustment mechanism to function. Once markets are restructured to allow the unimpeded operation of the market mechanism the rationale of the productivity solution is established.

For the long run general equilibrium position to be achieved, the marginal rate of substitution in consumption must equal the marginal rate of transformation in production across all markets. Thus, any good or factor market in which the marginal product price and marginal input cost is not in equilibrium becomes the objective of policy to lift factor input productivity so that equilibrium is attained. Because general equilibrium modeling assumes constant the factor land, capital substitution for labor becomes the engine of economic activity and output projections. Clearly desegregation of projection results between labor factor contraction and capital factor expansion through applied technological inputs becomes a questionable process. Serious doubt exists over the voracity of economic projections achieved with general equilibrium modeling and hence policy prescriptions derived from them. Rural Australia should look carefully at policy solutions based upon such suspect analysis and observe the old proverb when industry leaders and political parties espouse the virtues of microeconomic reform and the productivity solution i.e. "beware of strangers bearing gifts".

## **5.2 Conclusions**

Rural Australia is literally facing an enormous rethink of its future direction and structure. Past policy direction has failed to deliver economic stability to the sector; and, consequently threatens the environmental sustainability of the resource base. These conclusions flow from the analysis of the sector in this paper.

Empirical and theoretical analysis of long term data which determine the industry terms of trade demonstrate that past policy has failed because it did not recognize structural realignment of the rural sector in the Australian economy. The relative decline of the commodity sector of an economy occurs inevitably over time. Consumer expenditure patterns change as living standards rise. Subsequently, relatively less of the consumer's budget flows to food.

Rural leaders and political parties have over time chosen to disregard the macroeconomic consequences that flow from Engel's Law. They have viewed emerging problems in the rural sector as microeconomic structural issues which impeded efficient resource allocation. It is not surprising that eventually the Australian rural sector moved to a crisis of historical proportions. The response of leaders across the political spectrum has been to solve the rural income decline through increasing output by encouraging productivity gains. This has led to rising rural output with increasing reliance upon international markets for output surplus to domestic requirements.

The problem for the Australian rural sector was that other nations more informed about the problems of macroeconomic realignment within economies had adopted agricultural policies which supported their rural sectors through industry assistance to sell internationally their surplus output. Thus, the Australian productivity solution to rural realignment ran into the problem other nations had already addressed: domestic and international excess supply of agricultural output. Under such circumstances surplus output could be sold only by accepting lower and lower real prices. The theory of supply and demand did not remain motionless in the face of Australian political and rural industry leaders failing to recognize relative sectoral realignment of the economy over time as had other advanced nation states.

Solutions to the economic dislocation in the Australian rural sector will require a complete reassessment of: firstly the role of rural Australia as the nation moves into the twenty-first century, and secondly the structure of policy instruments to support the rural sector over time. This will require some research of policy instruments employed in other mature economies such as "set aside programs".

The policy issue of stabilizing factor endowment is of particular importance. Rural producers moving factor endowments to other industries at times of industry downturn through debt finance has been demonstrated as a significant contributor to the historical level of debt currently overhanging the sector. It has been argued that rural adjustment compounds the problem rather than offering a realistic solution. There should be therefore a return to rural reconstruction designed to stabilize industry factor endowment in times of industry dislocation. Rural reconstruction should be directed particularly to the small farm problem. Interest subsidy rural adjustment programs do not satisfactorily address the small farm problem as it tends to encourage farm build up of established properties which become non-viable through eroded equity.

Set aside programs offer a means by which factor endowment can be stabilized which would involve removing from production sufficient factor land to enhance industry viability and stability. Income support for rural producers prepared to withdraw land from production should be viewed as expenditure necessary to deliver a public good on the grounds of environmental sustainability of the resource base. Resource sustainability cannot be achieved if rural producers are incapable of profitable production at times of commodity price collapse.

Other policy instruments to structure a realistic industry policy for the rural sector are well understood and have been canvassed in past research. The current situation of rural Australia in which two major industries are in dislocation i.e. wool and beef requires urgent policy action. More of the same will not solve the fundamental macroeconomic structural problem that derives from long term sectoral realignment within the Australian economy. To continue the favored microeconomic and productivity agenda can only compound the economic dislocation that currently besets the rural sector. Wool and beef producers will transfer the factor land to wheat wherever possible with the inevitable collapse of the wheat industry. Indeed the paradox of poverty amongst plenty will take on a new dimension if the current microeconomic and productivity theology is not recognized for what it is in reality: economic dogma.

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<sup>i</sup> A.B.A.R.E., Commodity Statistical Bulletin, 1993, p.19

<sup>ii</sup> J.M. Keynes, "The General Theory of Employment, Interest and Money", Macmillan Press, 1973, p.30

<sup>iii</sup> Mr. Ian Macfarlane, Q.G.G.A. President, "Rural Watch", Sunday Mail, August 13th, 1995, p.108

<sup>iv</sup> "New Horizons: A strategy for Australia's Agrifood Industries", N.F.F. Aust. 1993, p.12

<sup>v</sup> The Hon. John Howard, "Address to the Cattleman's Union of Australia" Roma Conference, 28th August, 1995, p.2

<sup>vi</sup> L.H. [Ben] Rees, paper presented to the Symposium Rebuilding Rural Australia, Ernst & Young and Queensland University of Technology, Miles, 29th November, 1994

<sup>vii</sup> A.B.A.R.E. Commodity Statistical Bulletin, p.19, 1993

<sup>viii</sup> A.B.A.R.E., Index of Prices Received, op.cit.

<sup>ix</sup> Calculated by using Index of Prices Received *ibid*

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- <sup>x</sup> A.B.A.R.E. op. cit.
- <sup>xi</sup> Calculated from Farm Costs column, A.B.A.R.E., "Commodity Statistical Bulletin" 1993, p.19
- <sup>xii</sup> Calculated from A.B.A.R.E. op. cit. p.19
- <sup>xiii</sup> Paul Brennan, op. cit. p.11
- <sup>xiv</sup> A.B.A.R.E. op. cit.
- <sup>xv</sup> A.B.A.R.E. op. cit.
- <sup>xvi</sup> Edwin Mansfield, "Micro-economics; Theory and Application", W.W. Norton & Company Inc. 1970, p.p. 51-54 & 91-92
- <sup>xvii</sup> Paul Brennan, Director of Economic Research, N.F.F., "Beating the Commodity Price Cycle", paper presented, Commonwealth Treasury Seminar, 16th June, 1995, p.8
- <sup>xviii</sup> Edwin Mansfield, "Micro-economics; Theory and Application", op. cit. p.53
- <sup>xix</sup> "Rural Adjustment, Rural Debt and Rural Reconstruction", Report of the Senate Rural and Regional Affairs and Transport References Committee, Dec. 1994, p.79
- <sup>xx</sup> Paul Brennan, N.F.F. op. cit., p.2
- <sup>xxi</sup> Paul Brennan, N.F.F. op. cit., p.8
- <sup>xxii</sup> Paul Brennan, N.F.F. op. cit., p.9
- <sup>xxiii</sup> A.B.A.R.E., Update, April 1995.
- <sup>xxiv</sup> J.B. Penn, "The Food and Agricultural Policy Challenge of the 1980's", Rural Economy, Quart. Rev. Vol.2 No.1 Feb. 1980, p.91
- <sup>xxv</sup> Paul Brennan, N.F.F. op. cit., p.8
- <sup>xxvi</sup> I.C. Report on Meat Processing, 1994, Volume 1, p.p 16-17
- <sup>xxvii</sup> I.C. Report, Meat Processing, 1994, Appendix K, p.163
- <sup>xxviii</sup> Paul Brennan, N.F.F., op. cit.
- <sup>xxix</sup> Towards 2000: Issues and Challenges Facing the Cattle Industry Today, The Cattleman's Union of Australia Inc., March 199\_, Economic Solutions
- <sup>xxx</sup> N.F.F., "New Horizons", 1993, p.p 14-15
- <sup>xxxi</sup> Towards 2000, op. cit.
- <sup>xxxii</sup> Paul Brennan, N.F.F. op. cit. p.12
- <sup>xxxiii</sup> A.B.A.R.E., Commodity Statistical Bulletin, 1994, Table 20
- <sup>xxxiv</sup> E.P.A.C. Background Paper No. 38, Feb. 1994, Table 20
- <sup>xxxv</sup> Paul Brennan, "Beating The Commodity Price Cycle", p.16
- <sup>xxxvi</sup> J.M. Keynes, op. cit. p.378
- <sup>xxxvii</sup> E.P.A.C. Background Paper No. 38, Feb. 1994, p.26
- <sup>xxxviii</sup> J.M. Keynes, op. cit. p.18
- <sup>xxxix</sup> J.M. Keynes, op. cit. p.p. 25-26
- <sup>xl</sup> J.M. Keynes, *ibid*
- <sup>xli</sup> E.P.A.C. Background Paper No.38, p.30
- <sup>xlii</sup> Joan Robinson, "The Age of Growth" Gildersleeve Lecture, 2nd March 1976, Barnard College, University of Cambridge, published Challenge/May-June 1976, p.5
- <sup>xliii</sup> Paul Brennan, "Beating the Commodity Price Cycle" op. cit. p.11
- <sup>xliv</sup> E.P.A.C., op. cit. p.30
- <sup>xlv</sup> Joan Robinson, "The Second Crisis of Economic Theory", Richard T Ely Lecture, The American Economic Review, May 1972, p.4
- <sup>xlvi</sup> E.P.A.C. op. cit. p.30
- <sup>xlvii</sup> Kindleberger and Lindert, "International Economics", sixth Edition, Irwin Series in Economics, 1978, p.130
- <sup>xlviii</sup> E.P.A.C. Background Paper No. 38, op. cit. p.36
- <sup>xlix</sup> Paul Brennan, N.F.F , "Beating the Commodity Price Cycle", op. Cit. p.8