

GOVERNANCE AND REGIONAL INCOMES IN AUSTRALIA

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ABSTRACT: What effects does governance, industry or remoteness have on regional incomes? This paper uses linear regression and correlation analysis to investigate the relationship between income, local employment in governance of transactions, public administration, the remaining industry classes, and remoteness in 140 functional economic regions of Australia in 2006. Governance provides the advanced services required for trade and innovation. Unlike *de jure* regions, such as Local Government Areas, functional economic regions are defined to contain, to the maximum extent possible, both the homes and the workplaces of the labour force, thus minimizing spatial autocorrelation present in data from *de jure* regions. We use data from the 2006 Australian Census of Population and Housing and the Australian Standard Geographical Classification. The analysis shows that, of all these variables, only governance matters for regional incomes.

KEY WORDS: Income, Governance, Industry, Remoteness, Region.

1. INTRODUCTION

Regional disparities in income are a source of disadvantage and can have consequences for social and economic development and growth (National Economics, 2015). The 17th State of the Regions Report argues that there is an "...association between income inequality at a regional level and economic growth on a national level" (National Economics, 2015).

Policies responding to income disparities can become a significant drain on national and regional budgets. For example, concerns about widening regional inequalities accounts for the bulk of the European Commission's budget (Nazarczuk, 2015; Arbia *et al.*, 2010).

The Gini coefficient is a measure of inequality which ranges from zero, for no inequality, to one for extreme inequality. In 2005-06, the Gini coefficient for disposable household income across all households in Australia was 0.307: for the state capital cities inequality was slightly greater (0.310), and for the balance of each state it was lower (0.293)

(Australian Bureau of Statistics (ABS), 2007b). At the same time, average incomes in the capital cities of Australia were 16 per cent above those outside the capital cities (ABS, 2007b).

This paper investigates the effects on income in Australian functional economic regions in 2006 of the shares of the regional labour force engaged in governance of transactions (the transaction services industries), in each of the remaining transformation industries, and the remoteness classification of the region.

Wallis and North (1986) segregate industries into those which primarily conduct transactions, such as finance and trade, and those which primarily transform inputs into output, such as manufacturing or education and training.

“Every economic activity involves elements of transaction and other costs. ... [O]ur basic approach is to segregate economic activities and actors into those that are primarily associated with making exchanges and those that are not. The sum of the resources used by those associated with transacting make up our estimate of the transaction sector. ... Transaction costs are the costs associated with making exchanges, the costs of performing the transaction function. Transformation costs are the costs associated with transforming inputs into outputs, the costs of performing the transformation function” (Wallis and North, 1986: 97)

The transformation industries are thus defined as the industries which transform inputs into outputs. The notes to Appendix 1 identify the industry classifications allocated to the transformation industries.

This paper argues that variations in the local availability of transaction governance services are the principal structural cause of inter-regional variations in incomes. The aim is to demonstrate this proposition by separating the effects on regional income of the share of employment in transformation industries, the share of employment in transaction governance industries, and the remoteness of the region.

2. LITERATURE

Governance, Transaction Services and Regional Incomes

Income arises from transactions in markets in which goods and services are exchanged for money. Transactions have costs: “the operation of a

market costs something” (Coase, 1937: 392). Transactions require the services of both an institutional environment governing the acquisition and transfer of property rights and also, as Williamson (1996: 5) notes, institutions for the governance of transactions such as markets, hybrids, hierarchies, or bureaus.

Furubotn and Richter (2010: xi) point out that:

“[A]ny specific market order, or market design, has to find ways of dealing with certain activities of trade such as: search, inspection, bargaining, contract execution, control, and enforcement.”

Transaction services provide the governance required to assure the integrity of the search, inspection, negotiation, contract agreement, control and enforcement of rights activities which are necessary for the transactions of trade (Furubotn and Richter, 2010). The governance provided by transaction services enables the goods and services which regions produce to be exchanged for income.

Wallis and North (1986) defined and measured transaction services in the United States of America. The Wallis and North (1986) definition of transaction service industries has been used and adapted to local data sets in Australia by Dollery and Leong (1998), in Argentina by Dagnino and Farina (1999), in West Germany by Bischoff and Bohnet (2000), in Poland by Sulejewicz and Graca (2005) and in Bulgaria by Chobenov and Egbert (2007).

Transaction services have grown over time, have a central role in economic development and account for more than half of the Gross Domestic Product of the United States of America and of Australia (Wallis and North, 1986; Dollery and Leong, 1998). Wallis and North (1986) conclude that:

“[T]ransaction costs are a significant part of the cost of economic activity. One implication of this is that, throughout history, the costs of transacting may have been as much a limiting factor on economic growth as transformation costs” (Wallis and North, 1986: 121).

Wallis and North (1986) defined the transaction services sector as including all the activities involved in conducting transactions and exchanging and reallocating resources, such as sales, search, inspection,

negotiation, management, enforcement, finance, insurance, administration.

This paper adapts the methods of Wallis and North (1986) to produce estimates of the share of transaction services, or governance, in employment in Australian functional regions using data on employment in the transaction service industries in each region. These estimates are then used as measures of the governance of trade in each region. Hereafter, in this paper, transaction costs and governance have the same meaning; local costs of the governance of regional trade.

Regional development

Traditional explanations for regional income disparities (Nazarczuk, 2015) seldom involve institutions, governance or transaction services. Regional development practice has tended to seek growth in regional incomes by promoting and recruiting industry rather than by promoting and developing governance.

Yeung (2015: 1) argues that:

“[A] self-contained and endogenous view of regions and regional development can no longer hold water in this world economy characterized by increasingly interdependent economic activities that are organized through cross-border value chains and production networks spearheaded and governed by global leading firms” (Yeung, 2015, p.1).

This world economy view ignores the capacity of regional institutions, where they exist, to create linkages with global production networks and value chains. In this paper it is argued that local governance is endogenous and is necessary to sustain regional trade links with the outside world. If so, then local governance has a critical role in extending global production networks into remote regions.

Blakely and Leigh (2010) citing Friedman (2005) on the challenges of globalization for local communities, argue that globalization calls for:

“[A]n orientation away from traditional business development and recruitment toward ensuring all participants in a local economy have adequate preparation to make maximum contributions” (Blakely and Leigh, 2010, p. 3).

Globalization drives change in every locality. Continuous reinvention is needed ‘through new technologies, innovations and renewed commitments to ethical leadership’ (Blakely and Leigh, 2010: 3). Sassen (2000) noted the increasingly urban concentration of transaction governance services around the world. Saxenian (1996) and Farole *et al.* (2010) point to a growing literature focused on the institutional structures which govern transactions, and drive economic growth and incomes in regions. Farole *et al.* (2010) argue that explaining economic trajectories requires taking into account the role of both formal and informal local and society-wide institutions. They review the institutionalist approaches to economic development, including the role of governance and cost.

Best (2001: 69) argues that the institutional structures of a region, such as transaction governance or networks, do not guarantee growth. He proposes ‘the idea of the entrepreneurial firm as the driver of cluster dynamics and regional growth’ (Best, 2001, p. 69). While entrepreneurial firms can be drivers, they cannot exist without access to governance services institutions such as finance, marketing and trade.

Saxenian (1996) argues that:

“[M]ost companies or stable regions pursue a single technical option and, over time, become increasingly committed to a single technological trajectory. A network-based regional economy like Silicon Valley, alternatively, generates and pursues a rich array of technological and organizational options” (Saxenian (1996, p. 112).

Local governance enables a region to recombine ideas and materials and to pursue a wider range of options. All of these adaptations require governance to make new markets for the distinctive features and ideas of the place, and to implement the innovations, new technologies and practices required to build ethical communities and leaders.

Governance of transactions matters to regional incomes because governance gives remote buyers of regional goods and services the confidence needed to trade with the region. Governance, or transaction services, can therefore play a role in linking distinctive capability to market opportunity.

Remoteness and Incomes

Increasing remoteness is a modern feature of Australian human geography:

“One of the strongest features of the nineteenth-century Australian economy was the high proportion of the population living in non-metropolitan towns. ... Small towns benefited from the direct relationship between farm production and the need for farmers to have regular access to supplies and commercial services. ... Small town firms were protected by distance as services had to be consumed on the spot and high transport costs restricted competition from producers in other regions.” (Frost, 2008: 72-73).

Frost (2008) notes that improved transport and communication services led to the drift of population out of non-metropolitan regions. As transport, storage and communications infrastructure improved small town firms were no longer protected by distance, and the larger ‘sponge’ towns grew:

“[B]y creating jobs ... with strong links to their rural hinterlands, while also looking to Melbourne and Sydney for products and access to larger markets” (Frost, 2008: 78).

What became of the institutional resources providing governance of the trade transactions which enabled the settlers and producers to sell the tradable goods and services which they produced? Historical changes in the pattern of settlement gradually shifted transaction governance out of remote and outer regional areas, thus limiting the potential for local innovation and economic development. Improved transport, communications and technologies shifted mobile governance services out of the hinterlands and into regional and capital cities. The increased scale of governance services in the ‘sponge’ towns and cities can be expected to have increased the efficiency of these services, through improved specialization. However, increased specialization may diminish both the capacity of the now remote resident population in the hinterlands to recognize opportunity, to access the governance services required to innovate and to build trusted connections with faraway markets.

3. DATA AND STATISTICAL ANALYSIS

The principal hypothesis of this paper is that governance services have a primary role in income determination in regions. The paper aims to explore and compare the contributions made to regional incomes by the governance (or transaction sector) industries, by each of the remaining (transformation) industries, and by remoteness.

A secondary aim is to explore the effect of remoteness on the relationship between incomes and governance (transaction services).

This paper uses occupation by industry data from the 2006 Australian population census (ABS, 2006b, 2006c, 2007a) and the definitions of transaction service industries used by Wallis and North (1986) to construct estimates of the share of transaction governance employment in the labour force of each of the 140 functional economic regions in Australia defined for 2006 by Mitchell (2008) and described by Mitchell and Stimson (2010). Each functional region is classified to one of five remoteness categories (ABS, 2006d), based on the remoteness category in which the median population of the functional region resides. Median income is calculated from Australian Bureau of Statistics (ABS) tables from the 2006 Population Census for Statistical Local Area (SLA) and Indigenous Status (INGP) by Individual Income (weekly) (INCP).

The measure used to represent the governance sector for each functional economic region in this study is the sum of employment in the region in the industries of (F) Wholesale trade, (G) Retail trade, (J) Information Media and Telecommunications, (K) Financial and Insurance Services, (L) Rental, Hiring and Real Estate Services and (M) Professional, Scientific and Technical Services from ABS (2006a) all expressed as a share of the employed workforce in the region.

While the (J) Information Media and Telecommunications industry class of ABS (2006a) does facilitate search, inspection, sales and procurement through publishing, websites, telecommunications, broadcasting, newspapers and libraries, Wallis and North (1986) do not identify this class as a transaction industry. However, since Wallis and North (1986) conducted their study, this industry class has changed from print and wireless publishing to Internet services and search, expanding the range of information, advertising, search and inspection tools available to buyers and sellers.

The (M) Professional, Scientific and Technical Services industry class of ABS (2006a) is added to the transaction industries in order to capture the (693) Legal and Accounting services provided by professional firms, which are transaction industries. Most of the other services in this class

are business services related to defining requirements, search, marketing and management, and therefore can be treated as transaction services; these are (691) Scientific Research Services; (692) Architectural, Engineering and Technical Services; (694) Advertising Services; (695) Market Research and Statistical Services; (696) Management and Related Consulting Services; and (70) Computer System Design and Related Services. This industry class also includes transformation services in the (697) Veterinary Services section and in the (6991) Professional Photographic Services subsection (ABS, 2006a).

As Wallis and North (1986: 97) noted “every economic activity involves elements of transaction and other costs”. These other costs are transformation costs. Each industry class contains both transaction governance and transformation activities. The transformation industry classes have as their *primary* activity the transformation of inputs into outputs of goods and services, however, they do contain some transaction services. Similarly, the transaction industries have as their *primary* activity the conduct of transactions, however, they do contain some transformation services.

The presence of some transactions governance services in each measure of transformation activities may overstate the scale of transformation activities, and understate the regression coefficients; and similarly the presence of some transformation services within the measure of transactions governance may overstate transaction services and understate the regression coefficients. On balance we would expect the effects of these unmeasured governance and transformation services to offset each other to some extent, leaving only a minor effect on findings about the relative importance of governance services or transformation services on income.

In this paper, the aim is to separate the effects on regional income of the share of employment in transformation industries, the share of employment in transaction governance industries, and the remoteness of the region. Accordingly, the transaction governance services provided by managers, sales employees and administration workers employed in the region by transformation industries are not included in the data on transaction or governance services in each region. These employees are in the transformation industries where they arrange the transactions of the firm with suppliers and customers, and coordinate the allocation of resources within the firm (Wallis and North, 1986: 101).

Excluding these employees from the transaction or governance sector understates the aggregate scale of governance services in the region and thus increases their regression coefficient, and retaining these employees

overstates the scale of transformation services and thus reduces their regression coefficient. However, it does allow an estimation of the full contribution to regional income of the industries making up the transformation sector as well as giving a clear indication of the importance of the contribution of the specialized governance sectors.

Public Administration and Safety is classified as a transaction industry but is presented separately in this analysis because government at local level is involved in community development but may be less involved in facilitating trade.

All the data, except Median Weekly Income, are expressed as ratios in the range 0 to 1.

Appendix 2 presents a plot of regional income against the share of regional transaction governance in regional employment in 2006.

Simple Correlation Analysis

Appendix 1 provides a complete set of correlation coefficients and the notes to Appendix 1 provide definitions and sources of all data. The correlation coefficient describes the relationship between two variables each of which is assumed to vary randomly; in our case this variability is between functional regions (Christ, 1966: 26). The correlation coefficient takes no account of the effects of any other variables and does not indicate causality. We use correlation coefficients to better understand the interactions between individual variables.

Income: Only governance (TSec) (0.373, $p < 0.01$), Public Administration and Safety (PubAd) (-0.297, $p < 0.01$) and Very Remote (VryRem) regions (-0.402, $p < 0.01$) have coefficients of correlation with income which are statistically significant. Of these, only governance (TSec) is positively correlated with income.

The positive correlation of income with governance (TSec), and the lack of any significant correlations with any other industry sector, suggests that policies to stimulate regional governance may be an effective means of reducing regional income disparities or of enlarging opportunities in poorly performing regions.

The negative correlation of income with Public Administration and Safety (PubAd) and with Very Remote (VryRem) regions may reflect some substitution effects between these variables in 2006. Public Administration and Safety (PubAd) may have expanded in low income functional regions, such as Very Remote (VryRem) regions, under the former Australian Commonwealth Government Community Development Employment Projects program. This program was

abolished in stages following July 2007. Employment in Public Administration and Safety in four Very Remote functional regions exceeded half of the employed workforce in these regions in 2006.

Governance Services: In addition to their correlation with income, governance services (TSec) are also strongly and positively correlated with Other Services (OthSvc) (0.288, $p < 0.01$), with Major Cities (MjrCty) (0.292, $p < 0.01$), and with Inner Regions (InReg) (0.238, $p < 0.02$).

The positive correlation of governance (TSec) with Major Cities (MjrCty) and with Inner Regions (InReg) is consistent with Sassen (2000) who argues that governance services concentrate in major cities.

The positive correlation of governance (TSec) with Other Services (OthSvc) is unexpected and suggests further examination of ways in which the Other Services industry classification complements governance. The 2006 Australian Census Dictionary Industry of Employment Classification (IND06P) (ABS, 2006a) defines Other Services as including (94) Repair and Maintenance, (95) Personal and Other Services, (96) Private Households Employing Staff and Undifferentiated Goods and Service-Producing Activities of Households for Own Use. Within (95) Personal and Other Services are Civic, Professional and Other Interest Group Services: these include business, professional, labour and other association services, such as Chambers of Commerce and unions, which employ people in many regions who play a role in governance.

Governance (TSec) is also positively correlated with Manufacturing (Mfg) (0.223, $p < 0.05$), Construction (Constn) (0.228, $p < 0.05$), and Transport (Trnspt) (0.199, $p < 0.05$), all of which are substantial users of the finance and insurance services component of governance.

Governance (TSec) is weakly and negatively correlated with Health Care and Social Assistance (HlthSoc) (-0.196, $p < 0.05$), which has a strong and positive correlation with Public Administration and Safety (PubAd) (0.244, $p < 0.02$). Governance (TSec) is also strongly and negatively correlated with Public Administration and Safety (PubAd) (-0.462, $p < 0.01$) and with Very Remote (VryRem) functional regions (-0.455, $p < 0.01$). The negative correlation of transaction governance (TSec) with Public Administration and Safety (PubAd) and with Very Remote regions (VryRem) suggests that Public Administration and Safety (PubAd) is more evenly distributed across functional economic regions than transaction governance; this reflects the findings of Sassen (2000) that transaction governance services are concentrated in Major Cities.

However, the significant and negative correlations between Very Remote regions and both income (-0.402, $p < 0.01$) and transaction governance (-0.455, $p < 0.01$) is interesting and may reward further research.

Public Administration and Safety (PubAd) is also strongly and positively correlated with Very Remote (VryRem) regions (0.578, $p < 0.01$) reflecting the large share of employment in Public Administration in Very Remote regions. This may reflect employment under the Community Development Employment Program which was classified as employment in the 2006 Census (ABS, 2006a).

Public Administration and Safety (PubAd) is strongly and negatively correlated with Manufacturing (Mfg) (-0.451, $p < 0.01$), Other Services (OthSvc) (-0.410, $p < 0.01$) and Transport (Trnspt) (-0.538, $p < 0.01$); and less strongly and negatively correlated with Accommodation and Food (AccomFd) (-0.241, $p < 0.02$), Electricity Gas and Water (ElGW) (-0.222, $p < 0.05$) and Inner Regions (InReg) (-0.214, $p < 0.05$). These patterns may reflect concentration of Public Administration and Safety in inner city locations.

Agriculture Forestry and Fishing (Agric) is positively correlated with Outer Regions (OutReg) (0.412, $p < 0.01$) and negatively correlated with Major Cities (MjrCty) (0.429, $p < 0.01$), which reflects the geography of Agriculture. Agriculture Forestry and Fishing (Agric) is also negatively correlated with Construction (Constn) (-0.243, $p < 0.01$), and with Arts and Recreation (ArtRec) (-0.399, $p < 0.01$).

Mining (Mine) is positively correlated with remote regions (0.404, $p < 0.01$) but not significantly with regional income or with regional governance. Transaction services for both Mining and Agriculture tend to be managed in head offices of mining and bulk commodities trading businesses.

Multiple Linear Regression Analysis

We use multiple linear regression analysis which assumes a functional relationship between a dependent variable, in our case income in each region, and a set of independent variables, in our case employment in transaction governance, specified transformation industries, and remoteness. The analysis estimates a coefficient for each independent variable and a constant for the functional relationship which minimises a

measure of the deviations between the estimated and the observed values of income in each region.

The multiple linear regression result (standard error of coefficient estimate in parentheses) is as follows:

$$\begin{aligned}
 \text{Income} = & 828 + 394*\text{TSec} - 516*\text{PubAd} - 639*\text{Agric} - 525*\text{Mine} \\
 & (193) (148) \quad (212) \quad (246) \quad (283) \\
 & - 655*\text{Mfg} - 221*\text{ElGw} - 1507*\text{Constn} - 895*\text{AccomFd} - 581*\text{Trnspt} \\
 & (368) \quad (1994) \quad (584) \quad (370) \quad (1142) \\
 & - 1592*\text{EdTr} - 862*\text{HlthSoc} + 267*\text{ArtRec} - 547*\text{OthSvc} - 76*\text{MjrCty} \\
 & (825) \quad (414) \quad (1935) \quad (1521) \quad (84) \\
 & +54*\text{InReg} + 58*\text{OutReg} + 121*\text{Remote} + 10*\text{VryRem}. \\
 & (84) \quad (86) \quad (93) \quad (99)
 \end{aligned}$$

The r-squared statistic for this multiple linear regression is 0.32 which is significant ($p < 0.01$) (Mills, 1955: 771). The F statistic is 3.15; for a regression with 121 degrees of freedom (v_2) and v_1 of 18 the F99 value is 2.19 (Mills, 1955: 777). The regression reveals a statistically significant relationship between the variables $p < 0.01$.

The regression has six constants, allowing for 5 remoteness values and the regression constant, so that $n = 140 - 1 - 1 - 5 = 133$. The t statistic for the regression coefficients $n = 120$ is 2.358 for $p < 0.01$, 1.98 for $p < 0.025$, and 1.658 for $p < 0.05$ (Christ, 1966: 667).

All the coefficients, including the constant, are large numbers because all the independent variables are in the range 0 to 1. Across all regions the average share of governance (TSec) in the employed workforce is 0.216; the largest share of all the variables. The share for Public Administration is 0.118.

The positive regression coefficients for which $p < 0.01$ are for the Constant and governance (TSec); the negative coefficients with $p < 0.01$ are for Public Administration, Agriculture, Construction, Accommodation and Food. Health and Social Service has a negative coefficient with $p < 0.025$, and Mining, Manufacturing and Education and Training all have negative coefficients with $p < 0.05$.

The only statistically significant and positive regression coefficients are the Constant and the governance variable (TSec).

The Remoteness of the region does not have a significant effect on regional incomes, while all but Major Cities make a positive contribution to incomes. Every transformation industry makes a negative contribution to incomes, with the exception of Arts and Recreation.

Summary of Analysis

One hypothesis for this analysis has been that governance has a positive and statistically significant relationship with incomes in Australian functional economic regions. Both the correlation and regression analyses demonstrate a strong and positive relationship between local income and the share of local employment engaged in transaction governance. This finding supports the hypothesis.

While governance is not the only factor affecting regional incomes, in this model governance appears overwhelmingly as the most important factor.

The negative regression coefficients for Public Administration and Safety, Health and Social Services, Manufacturing, and Education and Training may reflect redistributive or labour cost reducing location choices by these industries. The result for Agriculture reflects drought conditions in 2006 (ABS, 2008) and these effects may also be reflected in negative coefficients for Construction, and for Accommodation and Food.

On balance the results suggest that decentralizing Public Administration and Safety is not likely to improve regional incomes, but decentralizing governance may improve regional incomes.

The negative correlation and regression coefficients between Mining and income may reflect the tendency for regional employment in mining to concentrate in Outer Regional and Remote regions which may have lower incomes.

A secondary hypothesis has been that remoteness presents a barrier to the development of governance of transactions and therefore to income. The remoteness zones, with the exception of Major Cities, attract positive but not statistically significant regression coefficients for their effects on regional income. Remoteness by itself does not consistently bring a significant change in income.

4. DISCUSSION

Coase (1937) defines transaction costs as the costs of using the price system. North (1987) describes the costs of exchange as the costs of

bringing order to transactions. In other words, transaction costs are the costs of the governance of transactions.

The aim in this paper has been to assess and compare the effects on regional incomes of variations in the shares of local employment accounted for by transactions governance, other industries and the remoteness classification of the region.

The concentration of the transactions governance in cities and high income regions is well known (Sassen, 2000). Remoteness does not alter this relationship: remote regions have less transaction governance and less income.

The strong performance of regional governance as a contributor to local incomes in this regression and correlation analysis is consistent with the findings of Dollery and Leong (1998) about the significant contribution of transaction services to Australia's National Income.

This result should encourage regional economic developers to seek ways of improving the governance of local transactions as a means to increase regional incomes. Regions with weak governance over local transactions will find it difficult to grow incomes.

Of course, high incomes can attract better the governance of transactions. Providers of transaction services, such as retail traders, are attracted to regions exhibiting high incomes. However, some high income regions have limited transaction governance services, particularly in mining and agriculture, where local enterprises rely for transaction governance on head offices or on bulk material traders located elsewhere. These regions will find it difficult to access new markets.

Some transaction governance services exist in every region, and they will be attracted to regions with opportunities for economic growth and development. Regional development policy makers seeking to grow local incomes should consider ways of enlarging the accessible range of local transaction governance services as a means of stimulating economic development by better connecting existing and potential industries to customers and investors.

Further research

The work reported here decomposes the effect on regional incomes of the transformation industries but does not decompose the contributions of the transaction governance industries.

Further research is required to disaggregate transaction services in order to define which element of the transaction services most contributes to regional incomes, and how these elements interact. This would contribute

to the research needed to integrate transaction governance into models of regional development.

Further research is also required to understand how the distribution of transaction services or governance across regions is changing over time. Studies show consistent growth in national transaction services in Australia (Dollery and Leong, 1998) and in the United States of America (Wallis and North, 1986).

The positive correlation of governance with the Other Services industry suggests a need for further research on the ways in which the Other Services industry classification complements governance. There may be a case for including Other Services in the transaction governance services.

The significant and negative correlations between Very Remote regions and both income (-0.402, $p < 0.01$) and transaction governance (-0.455, $p < 0.01$) is interesting. The regression confirms governance services as the principal source of variations in income. The association of very remote regions with low incomes and low governance services is demonstrated by the location of these regions in the bottom left hand corner of Appendix 2. The policy recommendation is to strengthen governance in very remote regions. Further research is needed to determine how stronger governance might be achieved in very remote regions.

These results are consistent with a positive relationship between transaction governance and income, but suggest that bringing transaction governance to very remote regions, as a means of raising incomes, may encounter difficulty.

One related hypothesis deserving further research may be that remote regions have relatively closed local economies, which protect local traders and limit the leakage of incomes to other regions. Stronger transaction governance could disrupt a closed economy. This research could investigate regional chambers of commerce as institutions with a role in the governance of regional transactions.

Most importantly, further research into practical ways of stimulating the regional governance of transactions may lead to the practical reduction of regional income disparities.

REFERENCES

- Australian Bureau of Statistics (ABS) (2006a). *Census Dictionary, Australia 2006 (Reissue)*. Cat. No. 2901.0.
- Australian Bureau of Statistics (ABS) (2006b). *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, 2006.
- Australian Bureau of Statistics (ABS) (2006c). *Australian and New Zealand Standard Classification of Occupations, (ANZSCO)*, 1st Edition. ABS Catalogue 1220.0.
- Australian Bureau of Statistics (ABS) (2006d). *Australian Standard Geographical Classification (AGSC) Remoteness Area Correspondences, 2006* Cat. No: 1216.0.15.003. Canberra, Australia (CP2006RA from 2006 SLA Correspondence).
- Australian Bureau of Statistics (ABS) (2007a). *Census of Population and Housing, 2006*, Cat. No. 2068.0
- Australian Bureau of Statistics (ABS) (2007b). *Household Income and Income Distribution, Australia, 2005-06*, Cat. No: 6523.0, Table 5 Income and Income Distribution (a), Household characteristics of persons. Canberra, Australia.
- Australian Bureau of Statistics (ABS) (2008). Feature Article: Drought, *Yearbook of Australia*, Cat. No. 1301.1
- Arbia, G., Battisti, M. and Di Vaio, G. (2010). Institutions and Geography: Empirical Test of Spatial Growth Models for European Regions. *Economic Modelling*, 27(1), pp. 12–21, DOI:10.1016/j.econmod.2009.07.004
- Best, M. H. (2001). *New Competitive Advantage: The Renewal of American Industry*, Oxford University Press, Oxford.
- Bischoff, I. and Bohnet, A. (2000). Gesamtwirtschaftliche Transaktionskosten und wirtschaftliches Wachstum (Social Transaction Costs and Economic Growth). *Jahrbücher für Nationalökonomie und Statistik*, 220(4), pp. 419-437.
- Blakely, E.J. and Leigh, N.G. (2010). *Planning local economic development: Theory and practice, 4th Edition*. Sage, Los Angeles.
- Chobanov, G. and Egbert, H. (2007). The Rise of the Transaction Sector in the Bulgarian Economy. *Comparative Economic Studies*, 49, pp. 638-698.
- Christ, C.F. (1966). *Econometric Models and Methods*. John Wiley & Sons, New York.
- Coase, R.H. (1937). The Nature of the Firm. *Economica*, New Series, 4(16), pp. 386-405.

- Dagnino-Pastore, J.M. and Farina, P.E. (1999). Transaction Costs in Argentina. Paper presented at International Society for New Institutional Economics.
- Dollery, B. and Leong, W.H. (1998). Measuring the Transaction Sector in the Australian Economy. *Australian Economic History Review*, 38(3), pp. 207-231.
- Farole, T., Rodríguez-Pose, A. and Storper, M. (2010). Human Geography and the Institutions that Underlie Economic Growth. *Progress in Human Geography*, 35(1), pp. 58-80, DOI: 10.1177/0309132510372005
- Friedman, T.L. (2005). *The World is Flat: A Brief History of the Twenty-first Century*. Farrar, Straus and Giroux, New York.
- Frost, L. (2008). Across the Great Divide: the economy of the Inland Corridor. In A. Mayne (Ed), *Beyond the Black Stump: Histories of Outback Australia*, pp. 57-84. Wakefield Press, Adelaide. ISBN 978 1 86254 800 8
- Furubotn, E.G. and Richter, R. (Eds) (2010). *The New Institutional Economics of Markets*. Edward Elgar, Cheltenham, UK.
- Mills, F. (1955). *Statistical Methods, Third Edition*. Holt, Rinehart and Winston, New York.
- Mitchell, W. (2008). CoffEE Functional Economic Regions. Paper presented at the ARCNSISS Tools and Techniques Workshop, Newcastle.
- Mitchell, W. and Stimson, R. (2010). Creating a New Geography of Functional Economic Regions to Analyse Aspects of Labour Market Performance in Australia. In P. Dalziel (Ed) *Innovation and Regions: Theory, Practice and Policy*. Refereed Proceedings of the 34th ANZRSI Conference, Melbourne, pp. 178-220.
- National Economics (2015). *State of the Regions Report 2015-16: Addressing Regional Inequality*, Australian Local Government Association (ALGA), Deakin, ACT.
- Nazarczuk, J.M. (2015). Regional Distance: the Concept and Empirical Evidence from Poland. In D. Szymańska and J. Chodkowska-Miszczuk (Eds) *Bulletin of Geography. Socio-economic Series*, No. 28, Toruń: Nicolaus Copernicus University, pp. 129–141. DOI: <http://dx.doi.org/10.1515/bog-2015-0020>
- North, D.C. (1987). Institutions, Transaction Costs and Economic Growth. *Economic Inquiry*, 25(3), pp. 419-428.
- Sassen, S. (2000). *Cities in a world economy, 2nd edition*. Pine Forge Press, Thousand Oaks, CA. ISBN 0-7619-8666-9

- Saxenian, A. (1996). *Regional Advantage: Culture and competition in Silicon Valley and Route 128*, Harvard University Press, Cambridge, Mass.
- Sulejewicz, A. and Graca, P. (2005). Measuring the Transaction Sector in the Polish Economy, 1996 – 2002. Paper presented at the 9th Annual Conference of International Society for New Institutional Economics, Barcelona, 22-25 September.
- Wallis, J.J. and North, D.C. (1986). Measuring the Size of the Transaction Sector in the American Economy, 1870 to 1970. In S.L. Engerman and R.E. Gallman (Eds.), *Long Term Factors in American Economic Growth*, (pp. 94-148). Vol 51 Studies in Income and Wealth, University of Chicago Press, Chicago. Access at URL <http://www.nber.org/chapters/c9679>
- Williamson, O.E. (1996). *The Mechanisms of Governance*, Oxford University Press, New York.
- Yeung, H. W. (2015). Regional Development in the Global Economy: A Dynamic Perspective of Strategic Coupling in Global Production Networks. *Regional Science Policy and Practice*, 7(1), pp. 1-24. doi:10.1111/rsp3.12055.

Notes for **Appendix 1.**

TSec: The share of the employed regional workforce reported as working in the Australian Census (ABS, 2006a) consisting of all persons employed, except those recorded as Not stated, Not applicable or Inadequately described, in industry classes (F) Wholesale Trade; (G) Retail Trade; (J) Information Media and Telecommunications; (K) Financial and Insurance Services; (L) Rental, Hiring and Real Estate Services; and (M) Professional, Scientific and Technical Services. The sum of the persons employed in these industries and occupations is divided by the sum of all employed persons.

Income: Median individual weekly income derived from downloaded Australian Census 2006 tables of Statistical Local Area (SLA) and Indigenous Status (INGP) by Individual Income (weekly) (INCP). Counting: Persons, Place of Usual Residence. (ABS, 2007).

All data on occupation by industry of employment was collected from downloaded ABS source tables for Statistical Local Area (SLA) and Occupation 06 (ANZSCO) (OCC06P) by Industry of Employment (ANZSIC06) (IND06P) (ABS, 2007). Counting: Persons, Place of Usual Residence

PubAd: The share of the employed regional workforce reported as working in the Australian Census (ABS, 2006a) industry classification (O) Public Administration and Safety.

Agric: The share of the employed regional workforce reported as working in the Australian Census (ABS, 2006a) industry classification (A) Agriculture, Forestry and Fishing.

Mine: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (B) Mining.

Mfg: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (C) Manufacturing.

ELGW: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (D) Electricity Gas and Water Services.

Const: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (E) Construction.

AccFd: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (H) Accommodation and Food Services.

Trnpt: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (I) Transport, Postal and Warehousing.

EdcTr: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (P) Education and Training.

HlthSoc: The share of the employed regional workforce reported in the Australian Census (ABS, 2006a) industry classification (Q) Healthcare and Social Assistance.

ArtRec: The share of the employed regional workforce in the Australian Census (ABS, 2006a) industry classification (R) Arts and Recreation Services.

OthSvc: The share of the employed regional workforce reported as working in the Australian Census (ABS, 2006a) industry classification (S) Other Services.

MajCit: Major City remoteness class (ABS, 2006d).

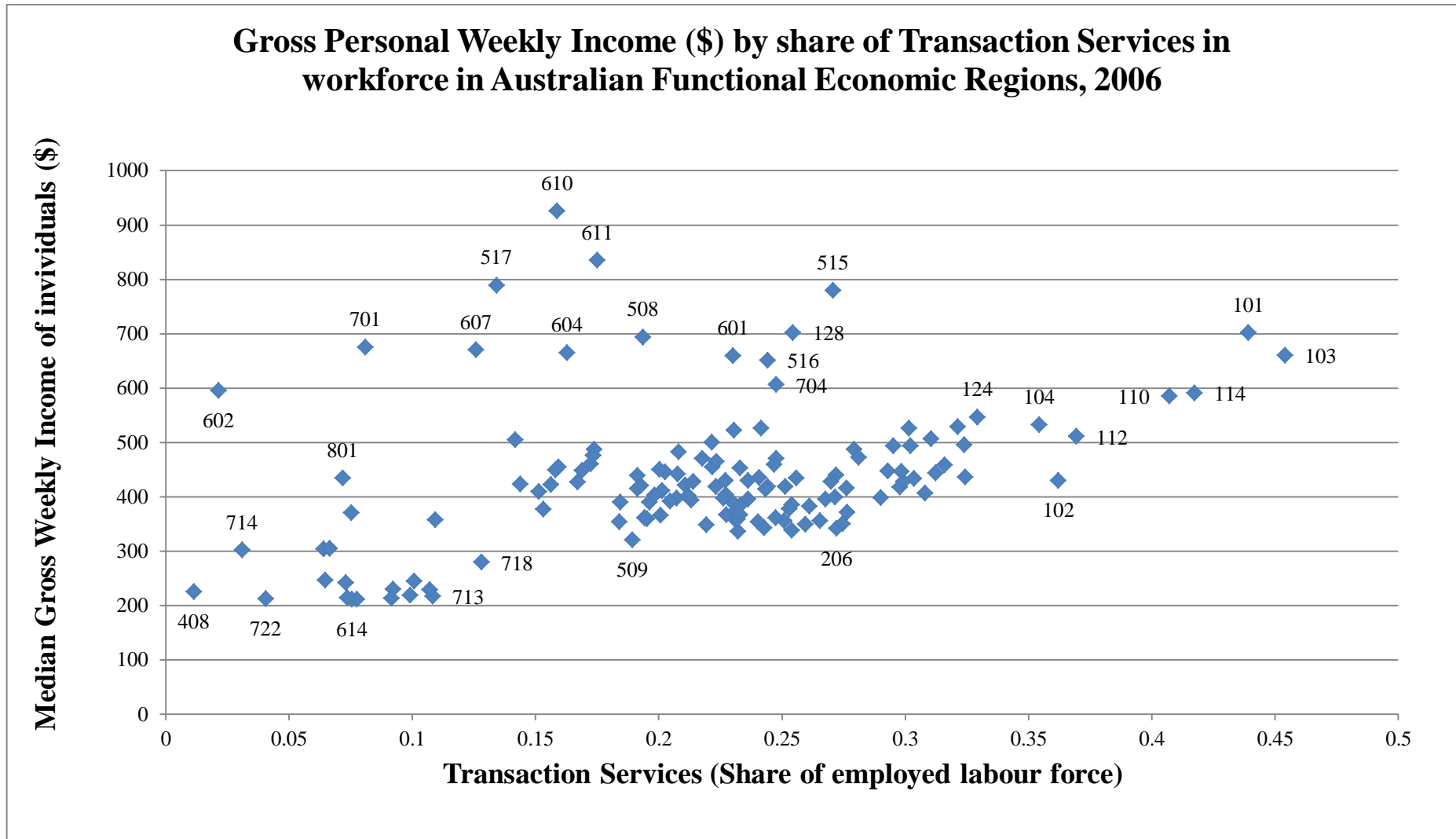
InnReg: Inner Regional remoteness class (ABS, 2006d).

OutReg: Outer Regional remoteness class (ABS, 2006d).

Remt: Remote remoteness class (ABS, 2006d).

VRem: Very Remote remoteness class (ABS, 2006d).

Appendix 2. Gross Personal Weekly Income by share of employment in Transaction Services, Australia, 2006.



Source: The Author

Location Codes for selected Functional Economic Regions in **Appendix 2**

Code	Location	Code	Location	Code	Location
101	Inner and South Sydney	508	Albany and Surrounds	701	Inner Darwin
102	Inner West Sydney Canterbury Bankstown	509	Bunbury Collie South WA	704	Palmerston Litchfield East NT
103	Sydney North	515	Ashburton-Roebourne	713	Groote Eylandt and surrounds
104	St George Sutherland	516	Port Hedland	714	Borrooloola and surrounds
110	Bathurst Orange	517	Broom West Kimberley	718	Yuendumu NT
112	Muswellbrook Upper Hunter			722	Petermann-Simpson NT
114	Shoalhaven	601	Hobart		
124	Far North Coast NSW and hinterland	602	Sorrell Tasman Peninsula		
128	Griffith Darling	604	Glenorchy Derwent Valley Tas		
		607	Launceston and Surrounds		
206	Frankston Mornington Peninsula	610	Meander Valley Tas		
		611	West Coast Tas		
408	Port Pirie Flinders Ranges SA	614	Flinders Tas		

Source: Mitchell and Stimson (2010)