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The great asymmetric divide: An empirical investigation of the link between indigenous and non-indigenous economic systems in Northern Australia*

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Abstract. This empirical study explores financial links between indigenous and non-indigenous economic systems in a remote river catchment in Northern Australia (the Mitchell). It finds evidence of a profound and asymmetric 'disconnect' between these economies: an exogenous increase in indigenous incomes raises the incomes of non-indigenous people, but the reverse is not true. Evidently, those seeking to improve the incomes of indigenous people in Northern Australia cannot simply seek to (*i*) increase payments to indigenous people, or (*ii*) expand the non-indigenous sector hoping that some benefits will 'trickle down'. Instead, structural change is required.

JEL classification: O180, O21, R51

Key words: Northern Australia, inequality, indigenous, economic development, input-output, multipliers

1 Introduction

Throughout the world, indigenous people are among the most socio-economically disadvantaged and vulnerable segments of society (Hunter 1999; World Bank 2001; Peredo et al. 2004; Leigh and Gong 2008). Indeed, Hall and Patrinos (2005, p. 4) note that 'being indigenous significantly

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increases one's chance of being poor', and in Australia, Hunter (1999) has observed that there are three 'Nations': the rich, the poor and the indigenous, with the latter's living standards being qualitatively and quantitatively different to other poor and rich Australians.

Worldwide, governments have been trying to address these disparities, and in 2008, the Australian government displayed widespread enthusiasm for the notion, setting policy goals for 'closing the gap'. According to the Department of Families, Housing, Community Services and indigenous Affairs (2009) this is the first time the Australian government and state and territory governments have jointly committed to clear, measurable targets in addressing indigenous disadvantages.[1] Yet some researchers have pointed out that the notion is neither new nor particularly promising (Altman 2009a; Pholi et al. 2009). In fact, there is a significant body of literature that seeks to determine how long it might take to close the gap between indigenous and non-indigenous socio-economic outcomes.

Wilson and Macdonald (2010) for example, note that it would take 63 years for the gap between indigenous and non-indigenous incomes in Canada to be erased – despite recent observed improvements. And in Australia, Taylor and Hunter (1998) estimated that indigenous incomes would have to increase by $1.6 billion per year (in 1996 dollars) to achieve income equality by 2006. Alas, those predictions have not materialized, and was, as Hunter and Gray (1999) argued, an extremely unlikely occurrence, given that indigenous people comprise just two per cent of the national population. More recently, Altman et al. (2008) predicted that it would take at least 100 years for (Australian) indigenous incomes to 'catch' up with non-indigenous incomes[2] and that the gap in labour force participation would not be eliminated within the next century.[3]

This problem is particularly pertinent in Northern Australia. Geographically, the region makes up 15 per cent of Australia's mainland and accommodates 16 per cent of Australia's indigenous population (in comparison to just 2 per cent nationally). Recent population projections by Carson et al. (2009) note that in Australia's North, the indigenous population is expected to continue to grow at a faster rate than its non-indigenous counterpart. As such, indigenous people will become an even more significant part of this region's population in the years ahead, and the gap between socio-economic outcomes for indigenous and non-indigenous people may become both more obvious, and more problematic.

Finding a solution to the issue is clearly easier said than done – and this may be at least partially due to the fact that indigenous economies are not simply smaller, more remote versions of non-indigenous economies. Gerritsen (2008) referred to the distinction between indigenous and non-indigenous socio-economic systems (and associated outcomes) as an example of a 'dual economy', and Altman (2001) pointed out that the nature of the indigenous economy is different from that of the non-indigenous one. Specifically, his hybrid economy model sought to highlight the fact that the indigenous economy is made up of the market, state and customary components and that linkages and interdependencies between those three components can be complex. Indeed Altman argues that:

1. The market usually exists in a consumptive rather than a productive manifestation. The productive form is very small and might include the art industry, the retail sector, commercial wildlife harvesting and sometimes communication with mining and tourism industries.

[1] see http://www.fahcsia.gov.au/sa/indigenous/pubs/general/documents/closing_the_gap/p1.htm

[2] The convergence of individual income is only evident in the long run trends – and even then convergence tends to be rather slow. Similarly, long run trends indicate that gaps in median household incomes will be closed in 94 years, those of home ownership (closely linked to income) is predicted to take place in around 100 years, and male life expectancy expected to be removed in at least 100 years. Perhaps the more optimistic of predictions are that of education where gap in never having to attend school is estimated to be closed within 2 and 14 years and that of household sizes where the gap is expected to closed within at least three generations.

[3] A finding based on even the most optimistic scenario for the rate of long run improvement in relative outcomes.

2. The state is presented everywhere in indigenous land as a service and welfare safety net provider, as law enforce and regulator; and that
3. The customary economy is based on productive activities such as hunting, fishing and gathering, land and species management, and the maintenance of biodiversity.[4]

There are a small, but growing number of studies that have sought to estimate the size of the customary economy (see, for example, Gray et al. 2005 who estimated that wildlife resources contribute between 2.9 to 8.2 per cent of income in a regional community on the central coast of New South Wales; and Altman 1987 who found that this percentage to be as high as 64 per cent in the remote community in Arnhem Land). And others have sought to estimate the significance of the flow of money from the Government sector (Gerritsen et al. 2010). But to the best of our knowledge, no one has attempted to use a macroeconomic model to empirically examine the extent to which the market side of indigenous and non-indigenous economies does, or does not, interact in Northern Australia. This is an important knowledge gap and serves to define the central aim of the research described in this paper – namely to empirically assess the strength of the financial/market links between indigenous and non-indigenous 'economies' in Northern Australia.

Although the research is focused on just one part of the world, the central finding (that there is a profound and asymmetric divide between indigenous and non-indigenous economic systems) and its associated policy implications (namely that one cannot stimulate the indigenous system by either injecting incomes directly into it, or by stimulating other parts of the economy) may be transferrable to other parts of the world – particularly those which have 'enclaves' of focused economic activity that is financially disconnected from the rest of the economy. As such, its contribution to the literature is significant.

Moreover, to build the models that facilitated this analysis, researchers had to collect data on, among other things, the expenditure patterns of indigenous and non-indigenous households. Although there is much research on household expenditure from institutions such as the Australian Bureau of Statistics, such studies do not distinguish between indigenous and non-indigenous households (Smith 1991; Australian Bureau of Statistics (ABS) 2005). In addition, although there have been papers examining the expenditure patterns of indigenous people – in Australia and in other parts of the world (Altman and Hunter 1998; Gerritsen et al. 2010) – these expenditures are rarely compared to the expenditures of non-indigenous people using the structured format so often adopted by central data-collecting agencies. For that reason, this research also fills an important information gap by presenting a comprehensive and comparative summary of the expenditure patterns of the two groups.

It is structured as follows: Section 2 provides an overview of our case study region; Section 3 describes our model and discusses the way in which it was populated with data; Section 4 presents results of our analysis; section 5 discusses the policy implications of those findings and Section 6 offers some concluding remarks.

2 The case study region

The research described in this paper was undertaken as part of a larger study of what is formally termed the Tropical Rivers (TR) region (Figure 1). Covering an area of more than 1.3 million km^2, the TR region comprises 55 river basins and extends across Northern Australia from the east side of Cape York in Queensland to the Kimberley in Western Australia. Driven primarily by the goal of providing information to those interested in promoting the sustainable use of

[4] This sector is interrelated and interdependent on the state and the market sectors of the economy (Altman, 2009b).

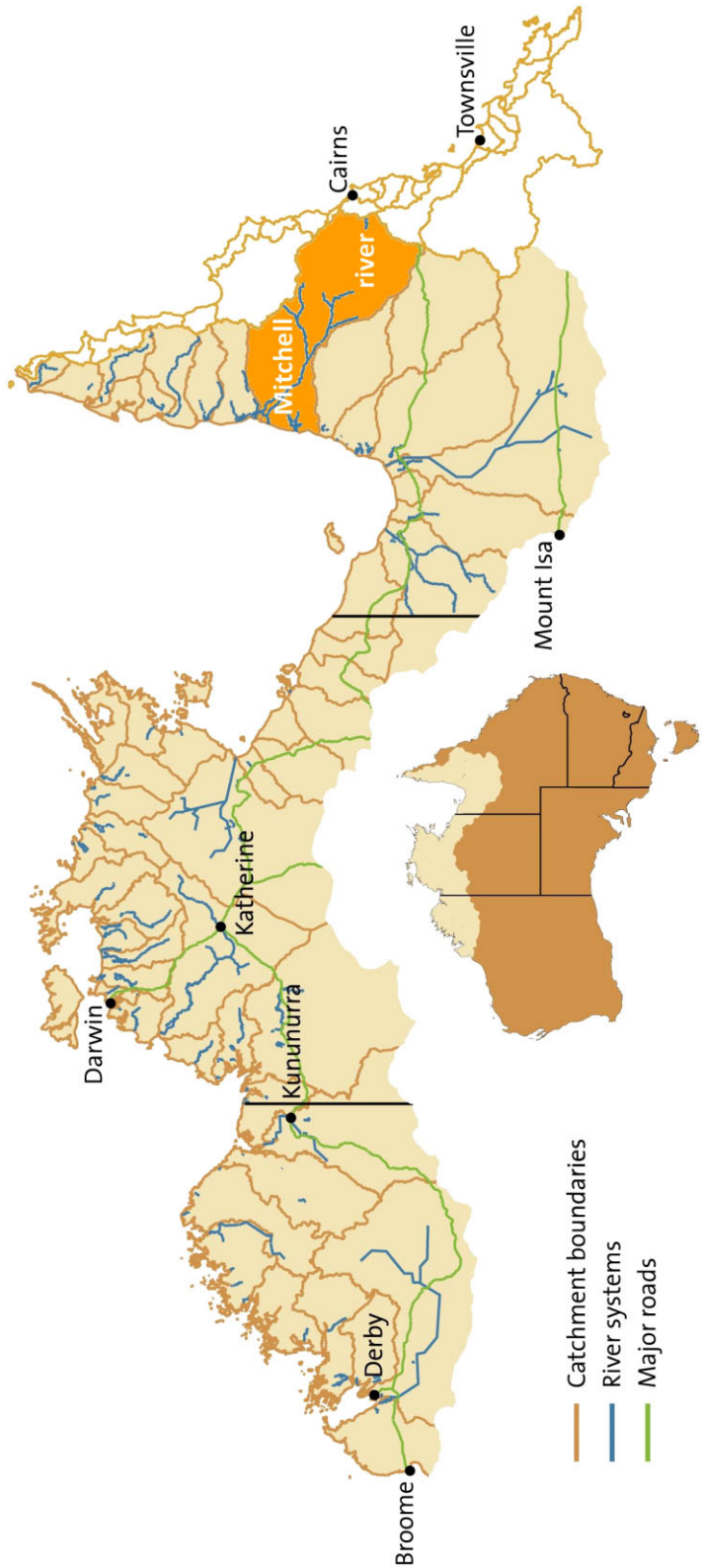

Fig. 1. The Tropical Rivers region and the Mitchell River catchment

Table 1. Socio-economic characteristics of the Mitchell River catchment

Characteristic	Summary
Estimated population (approximate)	5,500
Area of the catchment (km^2)	71,471
Population density	0.1
Median family income ($/weekly)	888
Ave. household size	2.6
Ave. number of people per bedroom	1.2
Aboriginal people (% population)	22.5
Torres Strait Island people (% population)	0.9
Sex ratio indigenous	88
Sex ratio non-indigenous	114
Sex ratio overall	109
Population turnover 2001–2006	50%

rivers, the project worked with regions delineated by biophysical, rather than by administrative boundaries. As such, it looked at river catchments. Although the larger parent project collected data for all 55 river basins, this particular piece of work undertook a more in-depth study of just one catchment: the Mitchell in Queensland (highlighted in Figure 1).

A few key socio-demographic characteristics of this catchment are summarized in Table 1. Importantly, the Mitchell River has a relatively small population (with just 5,500 residents), almost 25 per cent of whom are indigenous. Given the relatively high proportion of indigenous people, it is not, therefore, surprising to find that median family income is lower in this region (just $888 per week) than it is for the nation as a whole – $1,171 weekly (Carson et al. 2009).

3 The model

In an ideal world, we would have used a dynamic, multi-region, computable general equilibrium (CGE) model to explore the connections between indigenous and non-indigenous economies both across space and across time. However, while there are many good-quality CGE models in Australia, they are geographically coarse in the North, covering, for example, almost all of the Northern Territory (an area of more than 1.3 million km^2). In other words, there were no 'off the shelf' models available. Moreover, there was no publicly available information about the spending patterns of Australian indigenous people in our regions of enquiry and there was no publicly available information about the expenditure patterns of remote Australian householders (the ABS Household expenditure survey for example, does not collect information about the indigenous status of respondents, and only collects data in regions where there are at least 0.6 dwellings per square kilometre) (Australian Bureau of Statistics 2005) Consequently, the models had to be built 'from scratch'.

Again in an ideal world, researchers would have built a dynamic, multi-region, CGE – but that would have been an extremely expensive project to resource. Thus, the research reported here sought to take a 'modest step forward',[5] building an input-output (IO) model to facilitate the analysis. Rather than using 'top-down' approaches,[6] researchers used data collected from a wide range of sources (including both survey and secondary data) to build the models from the

[5] As per O'Doherty and Tol (2007, p. 158).
[6] E.g. the GRIT and the GRITSSIC techniques discussed in detail in Richardson (1985).

'ground-up'.[7] Full details of how that was done, in this extremely data poor environment, are provided in Stoeckl et al. (2011), with a briefer description given below.

3.1 Conceptualizing the model

The ABS is charged with running the country's five yearly censuses, and as such, is one of the most important sources of region-specific data across Australia. Consequently, it was important to ensure that the sectors used within the models coincided with those of the ABS – as set out in the Australian and New Zealand Standard Industrial Classification (ANZSIC) system. The ANZSIC structure identifies 17 different industry divisions, each of which is grouped into subdivisions, which are separated into groups, which, in turn, are separated into classes. Accordingly, the ANZSIC structure provided the opportunity to build highly disaggregated models.

However, there is evidence to suggest that (*i*) 'statistical modelling techniques that focus on and rely on extensive disaggregated data series will be expensive to support and, in the end, will have questionable reliability' (Gustavson et al. 1999), and that (*ii*) final multiplier estimates are not biased by aggregation (Richardson 1985). Moreover, the region under consideration has a very small population (Table 1) making it impossible to build highly disaggregated tables (the number of businesses would be very small, or even zero for most classes). Furthermore, many sectors/divisions which are vitally important to the overall Australian economy are all but non-existent in these regions, including: manufacturing (unless associated with mining), electricity and gas supply; water supply, sewerage and drainage services; wholesale trade; finance; and communication. Moreover, others sectors which are of less significance to the national economy (in terms of aggregate income and/or employment) are vitally important to the North, for example, government, agriculture, mining (Stoeckl and Stanley 2007).

In view of that, researchers chose to develop a 12 sector model combining several of the ANZSIC divisions, as detailed below (NB: from this point onwards, these aggregated sectors will be referred to using the word in *bold italics* below – i.e. *Retail* refers to the sector comprising both wholesale and retail trade).

1. ***Agriculture***
2. ***Mining*** + manufacturing
3. ***Retail*** trade + wholesale trade
4. ***Government*** + education + health
5. ***Accommodation***
6. ***Construction***
7. ***Transport***
8. ***Electricity***
9. ***Culture*** + personal
10. ***Finance*** + communications + property
11. **Households**, subdivided into
    i. indigenous households
    ii. non-indigenous households

Decisions about what sectors should/should not be aggregated were based on an understanding of the characteristics of those industries in this part of Australia (e.g., the manufacturing sector is all but non-existent, except where associated with mines, so mining and manufacturing were combined; similarly, wholesale trade is all but non-existent in these regions).

[7] Using the system first outlined in Stoeckl (2007).

Although conceptually equivalent to a 'standard' IO model, a key feature of the model is the inclusion of a household sector, divided in two. Including a household sector allows one to look at the way in which changes in demand for one particular sector affects household income (rather than just business income as is the case with IO models that exclude households). What's more, dividing the sector into indigenous and non-indigenous households allows the impacts of change on the incomes of those two groups to be measured separately. In addition, this model included a matrix describing the (indigenous/non-indigenous) employment requirements of each sector, making it possible to examine both the income and the employment impacts of change.

3.2 Populating the models with data

The model required data on:

1. business expenditure with other businesses (specifically, the proportion of income that each sector spends in other sectors);
2. business expenditure on indigenous and non-indigenous labour (specifically, the proportion of income that each business sector spends on indigenous and non-indigenous labour);
3. indigenous and non-indigenous household expenditure (specifically, the proportion of income that each type of household spends in other sectors); and
4. the number of indigenous and non-indigenous jobs associated with each dollar of production within each sector (to estimate employment multipliers).

3.1.1 Business expenditure with other businesses

Researchers had access to a database containing information on the purchasing and import behaviours of almost 1,000 private businesses and government organizations located across Australia's Far North (full details are available in Stoeckl et al. 2007). However, only 107 had been collected from firms within the Mitchell catchment. As such, the number of observations per sector was, in some cases, very small (Table 2).

In an effort to reduce standard errors, researchers therefore used business expenditure data that had been collected from all firms within the TR region (except those in the Darwin

Table 2. Number of 'observations' on business expenditure per sector in the Mitchell River catchment and across the entire TR region

Sector	Mitchell River catchment	TR Region
Accommodation	21	63
Agriculture	3	10
Construction	15	33
Culture	6	20
Electricity	3	4
Finance	11	23
Government	23	68
Mining	6	12
Retail	8	18
Transport	11	22
TOTAL	107	273

metropolitan area where firm characteristics are likely to differ significantly from those in rural areas) when the total number of 'observations' within any one catchment and sector was less than five (those highlighted in Table 2). The data were then used to build the matrix of technical coefficients (a core component of the IO model) using the approach outlined in Stoeckl (2012). Importantly, this bottom-up approach has been shown to generate multiplier estimates that are similar to those generated from IO models that have been constructed by large government agencies using 'top down' approaches – even when working with small numbers of firms within a given sector. Moreover, as is demonstrated later, the most significant findings of this research derive directly from data relating to the income and expenditure patterns of households (as opposed to businesses) – and the sample sizes for those data sets are much larger. As such, one can be reasonably confident that the model robustly represents (even if it does not precisely mimic), the economic structure of the region.

3.1.2 Business expenditure on indigenous and non-indigenous labour

Although the business expenditure database had information about the proportion of business revenues spent on wages (and other associated salary costs), it did not distinguish between money spent on indigenous and non-indigenous employees. Therefore, researchers used information from the business expenditure database in conjunction with ABS data to make such estimates.

Income and employment for indigenous and non-indigenous workers is collected in the ABS census every five years at a relatively fine geographic scale (collection districts). Hence, researchers identified collection districts that lay either partially, or entirely within the catchment, and ordered specialized tables from the ABS, detailing the number of indigenous and non-indigenous people employed in each sector as well as the median incomes obtained. The number of indigenous and non-indigenous employees within each sector was multiplied by the associated median weekly income (and by 52) to generate an estimate of the total annual income going to each household group in each sector. Estimates of the proportion of each sector's income paid to indigenous (and non-indigenous) households in the form of wages were then obtained by multiplying estimates of the share of total regional income accruing to indigenous (and non-indigenous) households by estimates of the total business revenues within each sector that were spent on labour.

Interestingly, the share of income accruing to indigenous people was small – in the order of 9 to 10 per cent of all household income. This is, despite the fact that indigenous people comprise almost approximately 25 per cent of the population.[8] More will be said of this important issue in the discussion section.

3.1.3 indigenous and non-indigenous household expenditure

Household expenditure data were collected from residents via mail out questionnaire and via interview (for indigenous householders to ensure a representative sample – indigenous response rates to mail out surveys are notoriously low). A total of 1,485 questionnaires were mailed out

[8] Because of the issue of 'undercount' associated with Indigenous people in the ABS census, these estimates are likely to understate the true incomes accruing to Indigenous people in these catchments. Therefore, readers are urged to interpret these results with caution. While it is true to say that more accurate data from the ABS would, most likely, alter these estimates, such alternations are unlikely to substantively alter the key findings 'punchlines' here: namely that indigenous people earn a disproportionately small share of total household incomes in these catchments.

Table 3. Number of householders covered in survey compared to estimated population – by indigenous status

	Indigenous	Non-indigenous
Number of respondents (households)	80	308
Total number of people living in houses of respondents	383	749
Estimated population of catchment at the time of the 2006 Census	1,238	4,262
Estimated % of population covered by sample	30.94	17.57

and 318 were returned completed giving an overall response rate of more than 20 per cent. Interview response rates in indigenous communities were almost 100 per cent.

All respondents (both mail-out and interview) were asked about the total number of people living in their household, and the total number of indigenous residents. If the number of indigenous residents was more than zero, the household was deemed to be 'indigenous'. Consequently, the information about the spending patterns of indigenous households was collected from both the mail-out survey and the interviews.

The 318 mail-out surveys received provided information about the expenditure patterns of 775 people – although some of these surveys (10) were, under the classification system described above, 'indigenous'. Allowing for information collected from both the mail-out and from the interviews, this sample is thus thought to cover approximately 18 per cent of the population of non-indigenous people and almost 31 per cent of all indigenous people in that catchment (Table 3). However, the estimate for indigenous people is likely to overstate the true representativeness of the sample since, as noted previously, ABS Census counts tend to underestimate the actual number of indigenous residents.

The sample data indicated that indigenous households were generally larger than non-indigenous households. Relatively few indigenous households had a member of the household with post-secondary school qualifications (either university or trade) – 6.25 per cent compared with 44 per cent for non-indigenous households.

In terms of employment, the government sector was the single largest employer – and the only significant employer – of indigenous householders. Very few indigenous householders were employed by other sectors. Our results corroborate those of the ABS, and importantly, the similarities suggest our sample is reasonably representative of the population at large.

Of noteworthy mention is the fact that compared to non-indigenous households, most of the indigenous household's expenditure is on food and beverages: almost 40 per cent compared to 20 per cent across all Australians. Part of this is likely to be attributable to the fact that indigenous incomes are much lower than those of non-indigenous Australians so that larger share of monies must go towards the purchase of necessities. Some of this may also be due to the relatively high price of food in remote areas. The fact that food and beverages comprise a larger share of the budget in poorer (indigenous) than in richer (non-indigenous) households, is not a new finding. Similar conclusions were made by Thiele and Piazolo (2002) – albeit a rural vs. urban context.

It is also interesting to note that the amount which the 'average' indigenous person spends each year in local retail outlets (i.e., those within the Mitchell River catchment) is greater than the amount which the 'average' non-indigenous person spends in local retail outlets. This is in spite of the fact that non-indigenous retail expenditure (per person, per annum) is greater than indigenous expenditure. This occurs because indigenous people spend a very large proportion of their money within their local community – particularly in Kowanyama, a community which can only be accessed by air during the wet, where indigenous residents are less likely to be able to afford to travel elsewhere to shop.

Table 4. 2006–2007 GVA, employment and employment per $M GVA for Queensland

Industry	GVA ($M, 2006) (1)	Employment ('000 persons) (2)	Employees per $M GVA (2) / (1)
Agriculture	6,234	76.6	12.29
Mining	36,079	221.8	6.15
Electricity	3,725	20.3	5.45
Construction	16,413	225.9	13.76
Retail	19,705	324.9	16.49
Accommodation	6,271	150.2	23.95
Transport	13,373	121.4	9.08
Finance	35,704	288.9	8.09
Government	35,381	561.5	15.87
Culture	5,611	129.1	23.01
Total	178,496	2120.6	11.88

Source: ABS (2009).

3.1.4 The number of indigenous and non-indigenous jobs associated with each dollar of production

Employment and gross value added (GVA) data were not available at the catchment level. So researchers used state-wide data to generate an estimate of the average number of employees per dollar earned within each sector (specifically, we divided the total number of employees within each sector by each sector's GVA (Table 4). While clearly not ideal, this approach has strong parallels with the use of location quotients to build IO tables (See, for example, Richardson 1985), and other options are not available in such a data poor environment.

These estimates were then converted into estimates of the number of indigenous and non-indigenous employees per dollar of output using the data supplied by the ABS to apportion the total number of employees per $M of GVA across sector and by indigenous status (Table 5). For example, the number of indigenous employees per dollar of GVA in the Agricultural sector was calculated as:

$$\frac{\text{No of Indigenous employees working in the Agricultural sector (52)}}{\text{Total no of employees working in the Agricultural sector (52 + 974)}} \times \text{Employees per \$ GVA in the QLD (12.29)} = 0.66.$$

4 Results

4.1 Type I and Type II income multipliers

The IO model was used to assess the impact of a one-dollar increase in income (or final demand) in each of the sectors identified in Section 3. Figure 2 illustrates the aggregated regional effects that occur across all industry sectors (type I multipliers) and across all industry AND all households (type II multipliers).

Specifically, it shows the (estimated) total regional impact of a one dollar 'stimulus' within each individual sector.[9] These estimates indicate, for example, that if the Accommodation sector

[9] Assuming, of course, that all of the assumptions underlying the IO model (e.g. constant prices, constant technology, and unlimited access to resources) hold true.

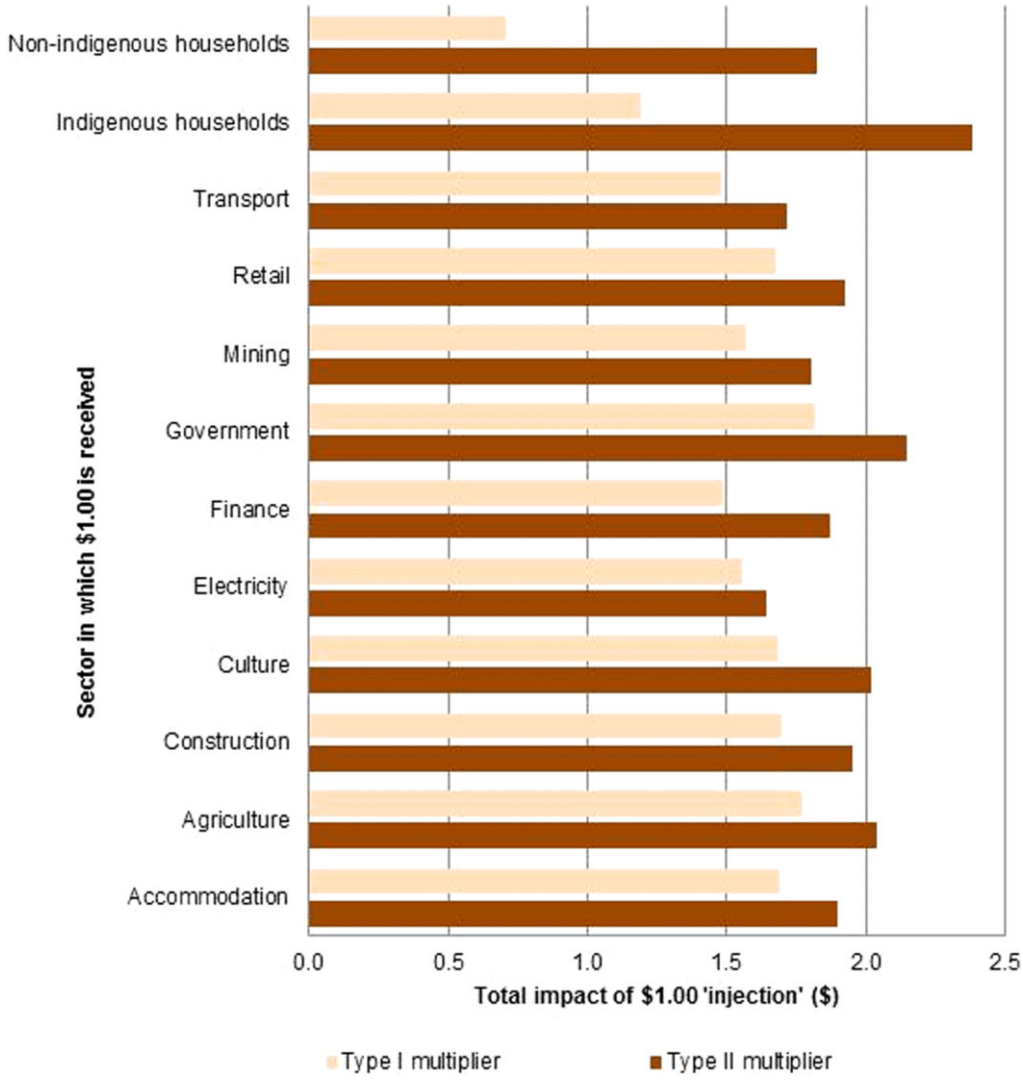

Fig. 2. Income multipliers by sector

were to receive an extra dollar of income, then the TOTAL change in regional income, after allowing for the endogenous 'flow on' spending effects in *other businesses*, would be approximately $1.69 (the type I multiplier). If one allows for the endogenous 'flow on' spending effects from *both businesses and households*, then the total regional effects are closer to 1.9 (the type II multiplier). Overall, the multipliers are quite small, a result that was expected given that the economies to which this IO model applies is relatively small in size Table 5.

Table 6 details the way in which the aggregate 'impacts' depicted in Figure 2 are distributed across each individual sector and highlights which sectors gain most/least from these changes. If one reads down the first column of Table 6, one can see that:

- A one-dollar increase in final demand within the accommodation sector will generate a net increase in regional income of $1.90. Most of that money stays within the accommodation

Table 5. 2006–2007 persons employed per $M GVA – by sector and indigenous status

Sector	Indigenous	Non-indigenous
Agriculture	0.66	11.63
Mining	0.31	5.84
Electricity	0.00	5.45
Construction	0.35	13.41
Retail	0.25	16.24
Accommodation	0.86	23.09
Transport	0.45	8.63
Finance	0.29	7.80
Government	6.40	9.47
Culture	0.85	22.16
Total	1.66	10.22

sector although the finance sector, the wholesale sector and non-indigenous households each receive approximately 20 cents. Indigenous households receive just one cent in flow-on effects – approximately one-half of one per cent of the total regional stimulus, and just one per cent of the total flow-on effects.

- The story is similar in other industries. As depicted in columns 2, 3 and 4 (which respectively, show the impact of a one-dollar stimulus in the agricultural, construction, and cultural sectors) the total, regional multiplier is close to two, but just one cent accrues to indigenous households in the form of increased incomes.
- The largest indirect increase in indigenous incomes occurs if one stimulates the government sector, but even there, the increase is just five cents.

4.2 Indigenous and non-indigenous employment multipliers

In addition to assessing the way in which expansion of a particular sector will affect regional incomes, the model was used to assess the way in which the expansion of different sectors was likely to affect employment. This was done by looking at the impact of a one million dollar increase[10] in the income (or, more precisely, final demand) of each of the 10 different sectors identified within the model, and how it would affect employment for both indigenous and non-indigenous households.

As shown in Figure 3, if there were a one million dollar increase in the demand for goods and services provided by the accommodation sector (caused, perhaps, by growth in the tourism sector), then this would generate approximately 30 new jobs – counting the direct, indirect and flow-on effects from increased household consumption.[11] In contrast, a one-million dollar increase in the final demand for goods and services provided by the mining and manufacturing sector would generate, in aggregate, closer to eleven jobs.

Also evident from the chart, is the sharp contrast between the size of the employment multipliers associated with indigenous and non-indigenous people. With the notable exception of the government sector, few indigenous jobs are created when sectors expand.

[10] A one million dollar change was used in place of a one dollar change since numbers would otherwise be too small to measure.

[11] Assuming, that there are no structural changes to the economy and/or changes in prices that might alter the relationships specified in the input-output tables.

Table 6. Total change in output/incomes following a one-unit change in final demand within a single sector

Sector in which impact is felt	Sector in which initial one unit ($1) change occurs											
	Accommodation	Agriculture	Construction	Cultural + personal	Electricity	Finance + communications + property + business	Government + education + health	Mining + manufacturing	Wholesale + retail	Transport	Indigenous households	Non-indigenous households
Accommodation	1.01	0.02	0.03	0.04	0.01	0.03	0.03	0.03	0.04	0.02	0.05	0.03
Agriculture	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Construction	0.10	0.05	1.12	0.07	0.19	0.04	0.09	0.06	0.06	0.03	0.05	0.05
Culture	0.01	0.01	0.03	1.04	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Electricity	0.12	0.06	0.06	0.08	1.07	0.05	0.07	0.05	0.07	0.04	0.10	0.07
Finance	0.18	0.14	0.16	0.16	0.10	1.16	0.23	0.14	0.18	0.14	0.28	0.19
Government	0.01	0.03	0.02	0.03	0.02	0.02	1.04	0.03	0.03	0.02	0.03	0.02
Mining	0.01	0.00	0.01	0.00	0.00	0.00	0.01	1.08	0.01	0.01	0.00	0.00
Retail	0.20	0.25	0.22	0.22	0.08	0.15	0.31	0.14	1.21	0.18	0.62	0.28
Transport	0.05	0.09	0.05	0.04	0.07	0.04	0.04	0.04	0.07	1.04	0.06	0.06
Indigenous households	0.01	0.01	0.01	0.01	0.00	0.03	0.05	0.01	0.01	0.01	1.01	0.01
Non-indigenous households	0.20	0.25	0.25	0.32	0.08	0.35	0.27	0.23	0.24	0.22	0.18	1.11
Total impact	1.9	2.03	1.96	2.01	1.63	1.88	2.15	1.82	1.93	1.73	2.39	1.83

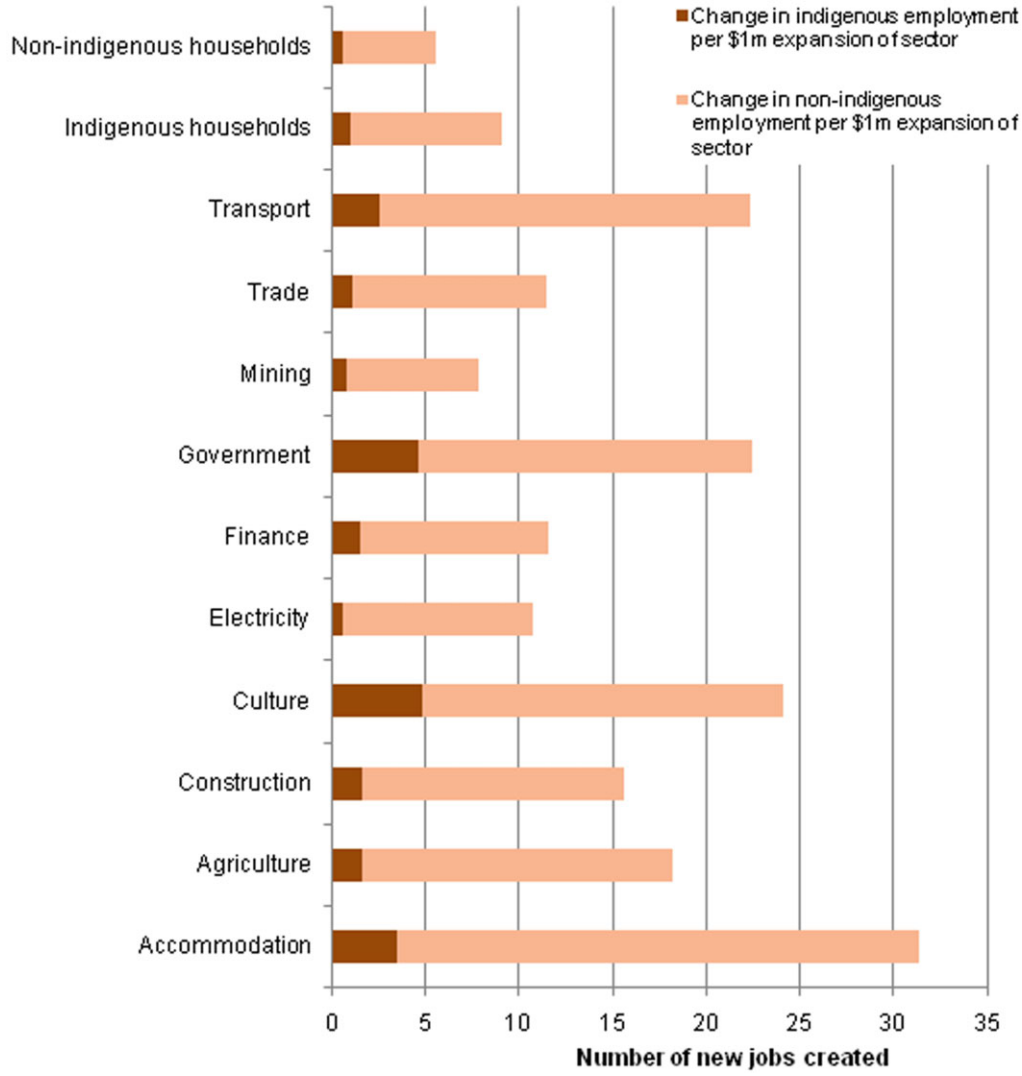

Fig. 3. Indigenous and non-indigenous employment 'multipliers' by sector
Source: Adapted from Stoeckl, 2010.

5 Discussion

Our empirical results conclusively confirm Altman's (2001) observations regarding the 'market' in indigenous communities. indigenous people tend to spend money in the market (the dominating consumptive relationship), but do not receive money from it (the absent productive relationship). Instead, they rely upon both the state, and the customary economy for income.

But this analysis does more than confirm Altman's claims, since it allows one to empirically assess the implications. The clear message emanating from this analysis is that it matters not whether a 'stimulus' (i.e., extra income) is delivered to private businesses (for example, in the form of more customers) or to private households (for example, in the form of a tax refund), the same general observation holds true: the sectors which gain the most from such a stimulus include retail, finance and non-indigenous householders. But very little money and very few jobs ever flow from the non-indigenous sector to indigenous households. For the most part, money that is

injected into regional businesses (most of which are owned or staffed by non-indigenous people) seems to either flow (*i*) outside the region; (*ii*) to other businesses; or (*iii*) to non-indigenous households. Hence our reference to the divide between indigenous and non-indigenous systems.

Moreover, our analysis shows that when indigenous incomes are increased exogenously, non-indigenous people capture more of the (flow-on) multiplier effects than do indigenous people.[12] Hence, out use of the word 'asymmetric'. The research presented in this paper thus indicates that one should not be surprised by the existence, or the persistence of the gap between indigenous and non-indigenous socio-economic outcomes. The 'asymmetric divide' so apparent in the simulated results is occurring because:

1. Few local businesses are owned or operated by indigenous people and few indigenous people are formally employed by these organizations – so there is little opportunity for indigenous people to earn money within the local region. Even where employment levels are relatively high (as in, for example, the government sector) the very low rates of pay received by indigenous employees mean that relatively little stimulus received by the non-indigenous sector flows through to these people. Put simply, there is no structural avenue by which monies are able to flow from the non-indigenous to the indigenous sectors in regions such as these. This weak structural avenue is depicted by a dotted grey line in Figure 4; and

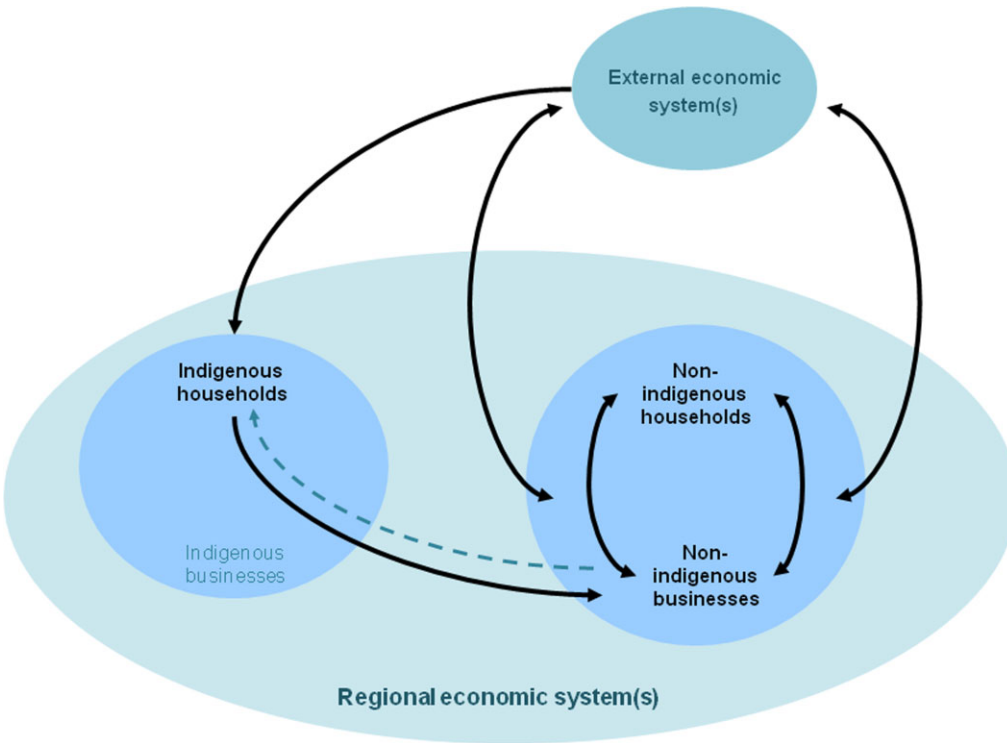

Fig. 4. The great asymmetric divide

[12] The second last column of Table 6 shows that a one dollar exogenous increase in indigenous incomes results in Indigenous people in the Mitchell gaining a flow-on benefit of one cent and three cents, respectively, whereas non-Indigenous people gain an increase in income of 18 cents.

2. Indigenous people spend a large proportion of their income locally – so non-indigenous residents of these areas have much to gain when indigenous people's incomes rise. In most cases, financial connections between indigenous and non-indigenous sectors are affected by external organizations as when, for example, the federal government collects taxation or royalty revenues from non-indigenous households and businesses and then redistributes them to indigenous householders. Nonetheless, when money is injected into the indigenous system it does not remain there: instead it flows almost directly back to the non-indigenous system when the indigenous householders spend their new-found wealth on food (at stores which are most often owned by non-indigenous people) and on housing (also, often owned by non-indigenous people). This too, is illustrated in Figure 4, by the strong black line that represents the flow of money from indigenous households to non-indigenous businesses.

Importantly, these results are robust and relatively insensitive to changes in the technical coefficients within the 'main' body of the IO table. In other words, it is not the technical coefficients within the IO model that are not driving results – it is the low earnings and the high spending of indigenous people (relative to non-indigenous people). As such, more sophisticated models (e.g., computable general equilibrium models) would not generate vastly different conclusions.

The key policy message here, therefore, is that the asymmetric divide that drives these results is likely to continue until, or unless there is structural change. If indigenous people who want change (some, perhaps many, may strongly prefer to maintain links with the cultural/customary economy, minimizing links with the market), then this analysis clearly shows that the structural changes which need to be considered are those that help to increase the share of money that flows to indigenous people through the market.

Finally, this analysis also highlights a well-known, but often overlooked (or forgotten) fact: namely that some industries may be able to generate significant business income and/or incomes for some householders, but will not necessarily deliver considerable localized benefit in terms of, for example, employment (be it indigenous or otherwise). As demonstrated in our employment analysis, a one million dollar expansion of the accommodation sector creates, in aggregate, almost three times as many new jobs than an equivalent expansion of the mining sector.

Evidently, development strategists may need to explicitly acknowledge that more income does not always translate into more jobs, and make conscious decisions about: (*i*) what it is they wish to 'develop' (e.g., income or employment?); and (*ii*) where it is that they wish the development benefits to occur (in the regions, in urban centres, or even overseas?). Clearly, those who are only interested in expanding regional income might hold quite different views about which sectors that could or should be supported, than those interested in expanding regional employment, and these groups might hold very different views from those who wish to expand federal government tax revenues.

6 Concluding remarks

The research presented in this paper describes financial flows between indigenous and non-indigenous businesses and households in a remote region in Northern Australia. It finds that there is a significant, and asymmetric disconnect between the two groups, and thus provides empirical estimates that allow one to assess the magnitude of the phenomena described by Altman (2001), who noted that the market is largely present for 'consumption' rather than for 'production' in remote indigenous economies.

The policy implications of these findings are profound. They indicate that one cannot promote indigenous economic development by either (*i*) 'stimulating' the economy *per se*; or by

(*ii*) 'giving' more money to indigenous people. When the former policies are tried, money simply circulates within the non-indigenous economy; when the latter approaches are tried, the money flows directly from the indigenous to the non-indigenous sector – much like 'pouring water through a sieve'.

The asymmetric disconnect is likely to continue until, or unless there is structural change. Some people may want the divide to persist, instead preferring to maintain links with the customary, rather than the market economy. But indigenous people who desire stronger links with the market, may wish to concentrate efforts on promoting two important structural changes, namely those which: (*i*) increase indigenous ownership of productive assets (including land, water, and capital); and (*ii*) improve indigenous labour market outcomes (i.e., employment rates and incomes). These significant changes will not occur without long-term commitment from residents, government and industry, together with substantial investments in time and money. But such changes have the capacity to remove the 'divide', address the asymmetry, and thus make it possible for demand side polices (or indeed any stimulus) to effectively promote indigenous development.

Finally, it important to stress that although based in Australia, the results may well be transferrable to other settings. Indigenous people worldwide are among the most socio-economically disadvantaged members of society. Yet, despite decades of research into the extent of the problem, little progress has been made: in most countries the gap between indigenous and non-indigenous incomes remains significant. Moreover, having a significant endowment of natural resources does not provide countries with immunity from the problem. Although conventional economic reasoning suggests that abundant natural resources have the potential to promote greater opportunities for economic development (Bulte et al. 2003), there are numerous examples of countries suffering from what is often termed 'the resource curse' (Limi 2007).

Our results highlight a common problem – namely that, simply injecting money into a region does not mean that those for whom the injection is intended will benefit most. Similar findings were observed in the case of Bolivia, where Thiele and Piazolo (2002) used the social accounting matrix (SAM) to analyse the potential effects of a redistribution of income (from rich to poor). They concluded that the redistribution would not do much to correct for the disparities occurring in income distribution: poorer household groups remain barely affected, while their richest counterparts (employers) receive in the order of more than 10 times their income. Similarly, SAM was used to examine the distributional characteristics associated with local economic development policies targeting several sectors in a small rural region in Wisconsin – with the aim of addressing the lagging rural income growth. Comparable to the findings here, high income households received 57–63 per cent of earned income from changes associated with different production sectors (agricultural production and processing, forestry production and processing, and tourism), while low income households received about 2–6 per cent of earned income. According to Leatherman and Marcouiller (1996), these distributional patterns are attributed to the variable ownership of productive factors by household income classes. This is consistent with the findings here.

In short, the 'asymmetric divide' that has been empirically documented in this paper may serve to at least partially explain the presence, and persistence of inequalities – particularly in developing countries experiencing the 'resource curse'*:* mining companies sometimes operate as disconnected 'enclaves' within their host communities (e.g., Faal 2007). Research that seeks to replicate these findings in other regions would thus be particularly useful. If the results are transferrable, then so too may be the policy implications, thus pointing the way to changes that may help improve the lives of people in rural and/or remote regions throughout the world.

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