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**Rent Capitalization and Transportation
Infrastructure Development
in Jakarta, Indonesia**

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Abstract

Escalating traffic problems in the world's mega-cities combined with fiscal constraints demand that innovative approaches to road financing be pursued. An efficient and equitable finance program should pass on charges for road improvements to beneficiaries, including property owners. In this paper, we evaluate the degree to which proximity to freeway interchanges gets capitalized into office rents, controlling for factors like regional accessibility, using Jakarta, Indonesia as a case study. The research shows strong capitalization effects, with rent premiums decaying exponentially with distances from interchanges. The research also shows that office rents are a stronger function of distance to Jakarta's historical center, Monas, than a gravity-based measure of accessibility to upper-income households. Thus, a monocentric measure of location explained variation in office rents better than a polycentric measure of proximity to labor markets. While value capture principles are attractive in theory, implementation is particularly difficult in developing countries like Indonesia. Jakarta has actually had a betterment tax program in place for over a quarter a century, however the system has been plagued by poor administration and enforcement. We argue that shifting betterment tax financing away from a focus on residential properties to high-end office and commercial land uses would likely yield higher rates of return and would be far easier to implement, in part because commercial land titles are more transparent.

Rent Capitalization and Transportation Infrastructure Development in Jakarta, Indonesia

1. Introduction

It is today widely accepted that improvements in transportation infrastructure are vital toward achieving sustained economic expansion in developing parts of the world. Today, transport investments account for up to 40 percent of public-sector expenditures in less developed countries (Button, 1993; Leinbach, 1995). Upgrading transportation facilities is particularly necessary in the world's megacities, especially given motorization growth rates of 10 to 15 percent annually in fast-growing Asian cities like Bangkok and Jakarta (Midgley, 1994). Yet traffic congestion problems remain pervasive and stubbornly persistent in most megacities, diminishing economic productivity and threatening overall quality of urban living. Traffic congestion in megacities is particularly troubling since these are the places that are increasingly being looked upon as catalysts to modernization and economic expansion throughout developing countries (World Bank, 1991; Peterson et al., 1991). Thus, the economic standings of even small towns and rural settlements are affected to some degree by the crippling transportation problems that continue to plague the primary cities of rapidly industrializing countries.

Finding efficient and equitable means of financing transportation infrastructure improvements remains a significant public policy challenge. Efficiency and equity principles argue for levying beneficiary charges for financing investments in roads and public transportation systems. Since the primary beneficiaries are users themselves, traditionally the mainstays of transportation infrastructure finance have been fuel taxes, tolls, and passenger fares. However, use-related charges normally go only far enough to cover operating and maintenance expenses. Often, grant transfers drawn from general treasuries are used to cover capital expenditures. Notwithstanding the fact that transfer payments do not always fare well on efficiency and equity criteria, the competing demands for public expenditures have strained the capacities of general treasuries to satisfy the funding needs of individual sectors like urban transportation.

An often overlooked but potentially promising source for financing urban infrastructure expansion in developing countries is through recapturing the value-added by public investments. Because the accessibility benefits provided by new transportation investments get capitalized into land values, returning portions of this value-added to public treasuries stands as an efficient and fair means of covering some of the outlays for new capital facilities. Benefit assessments, or betterment taxes, hold particular promise as forms of value capture that could provide much-needed supplemental funds for transportation infrastructure expansion in the developing world.¹ Betterment taxes, for instance, have generated substantial amounts for local road development in Bogota, Columbia for several decades, but so far has met with resistance in other parts of the developing world (Doebele, et al., 1979; Bahl and Linn, 1992).

While the principle of value capture is conceptually straightforward, designing and implementing a program in the urban transportation field has proven to be an elusive target. Part of the difficulty lies in the shortage of empirical evidence that demonstrates that accessibility gains get meaningfully capitalized into property values and rents. Only through building a body of evidence that reveals the degree to which transportation improvements, under a range of conditions, get translated in land values and commercial rents can the value capture principle move from the realm of concept to actual implementation.

This paper attempts to measure the degree to which accessibility more broadly and proximity to major highway facilities more specifically are related to commercial office rents, using Jakarta, Indonesia as a case context. As the national capital and economic hub of Indonesia, Jakarta has experienced phenomenal growth over the past two decades, with its population growing at a rate of 3 to 4 percent annually. Today, the capital district of Jakarta (DKI) has a population of over 8 million, while the population of the greater metropolitan area (Jabotabek) exceeds 17 million. Rapid growth, however, has strained Jakarta's urban transportation network to the limits, creating ever-worsening traffic congestion. As Indonesia's

¹ Benefit assessment districts are commonly used in the United States and other developed countries to finance sidewalks, street lighting, and local improvements within neighborhoods wherein benefits can be clearly associated with (i.e., meet the constitutional requirements of "rational nexus") a spatially definable group of property owners. Normally costs are apportioned amongst property owners within a district according to each landholder's pro rated share of property area, assessed values, or (in the case of linear improvements, like sidewalks) linear meters of street frontage.

gateway port for maritime and air transportation, severe traffic bottlenecks have stymied goods movements and, by lengthening commute times, lowered labor productivity. Such losses reverberate throughout the economy of Indonesia and threaten the pace of future economic expansion.

While the focus of this paper is on measuring the capitalization effects of transportation infrastructure, the analysis that is carried out affords the opportunity to explore different models of urbanization as predictors of commercial rents in metropolitan Jakarta. Specifically, the analysis also investigates which of two models of urbanization -- a single-center, or monocentric, versus a multi-center, or polycentric, model -- best predicts patterns of office rents in the region. Since land markets reflect the locational advantages associated with being near major commercial hubs, studying the relatively predictive powers of competing models in explaining variations in commercial rents offers empirical insights into greater Jakarta's dominant spatial pattern of urbanization.

2. Capitalization Studies in Context

Much of the empirical work conducted to date on capitalization effects of transportation infrastructure has concentrated on residential property markets in developed countries. The largest body of work has been with reference to the impacts of urban rail transit systems since the accessibility benefits associated with these investments tend to be spatially concentrated and thus more readily measurable. Dozens of studies from developed countries have estimated the effects of rail investments on property values, fairly consistently showing that proximity to transit stations exerts a positive influence for both residential and commercial-office land uses. For example, Al-Mosaind et al. (1993) examined single-family home prices within 500 meters of Portland, Oregon's eastside light rail transit line. Using hedonic price modeling approaches, their work revealed that being within 500 meters netted homes over a 10 percent sales price premium.

By comparison, comparatively little empirical work has been conducted on measuring the capitalization effects of transportation infrastructure in developing countries, in large part because of data limitations. Several studies of capitalization effects in residential land markets

have been conducted in Indonesia. A study of land readjustment projects in Indonesia found that road improvements increased land values by 32 percent, or US\$7 per m², in Bali, and in the case of a land consolidation project in rural Java, a 83 percent capitalization rate was attributed to road projects (Cervero, 1991). Another study showed that on average road infrastructure added 49 percent to residential land values in DKI Jakarta, with a premium of 30 percent within 5 km of the CBD and 88 percent at a distance of greater than 15 kms from the CBD (Dowall and Leaf, 1990).

For the megacities of developing countries, the greatest promise for recapturing the accessibility benefits accruing from transportation investments is thought to lie with the commercial office sector, for several reasons. One, land registries for residential properties are notoriously incomplete in many megacities. It has been estimated, for example, that only 25 percent of residential parcels in DKI Jakarta are registered with the National Land Agency, Badan Pertanahan Nasional, or BPN (Dowall and Leaf, 1992). In contrast, virtually all commercial office sites are registered and have clear land titles. Additionally, because they are often the “highest and best” land uses, offices tend to reap the greatest dividends from accessibility improvements. Thus from a practicable standpoint, it would be far easier to implement a betterment tax program targeted at commercial-office uses if for no other reason than the fact that they are far fewer in number (compared to residences) and values-added tend to be more appreciable and thus more measurable. Moreover, recent transportation improvements in third-world megacities often focus on rapidly growing commercial districts, making these areas more easily identifiable as the beneficiaries of new infrastructure. For these reasons, this paper focuses on measuring capitalization benefits associated with commercial-office buildings, as opposed to residential housing or other land uses, in metropolitan Jakarta.

Little work has been done on the capitalization effects of transportation infrastructure on commercial-office properties outside of the United States, and most of these studies have focused on rail transit investments (Landis and Lotzenheimer, 1995; Bollinger, 1996). A bibliographic search came up with no published citations of transportation-related rent capitalization studies for office activities. This knowledge gap is unfortunate since urban economic theory suggests the accessibility benefits accruing from major roadway infrastructure in highly congested, rapidly

growing cities of the third world are very high, much higher than in many first-world cities already well-endowed with freeway capacity and regional rail networks. It is in part to help fill existing knowledge gaps about roadway capitalization effects in third-world cities that this work was carried out.

3. Study Approach and Data Sources

To test the proposition that proximity to major road facilities and accessibility to labor markets get meaningfully capitalized into commercial property values in megacities of the world, we proceeded to compile empirical data on office real estate markets in metropolitan Jakarta. We sought to apply a hedonic modeling framework to the analysis, separating out the effects of proximity to major regional freeway facilities and accessibility to labor markets from other factors influencing office rents, like regional location (with reference to the central-city core) and attributes of office sites themselves, such as building age and site amenities.

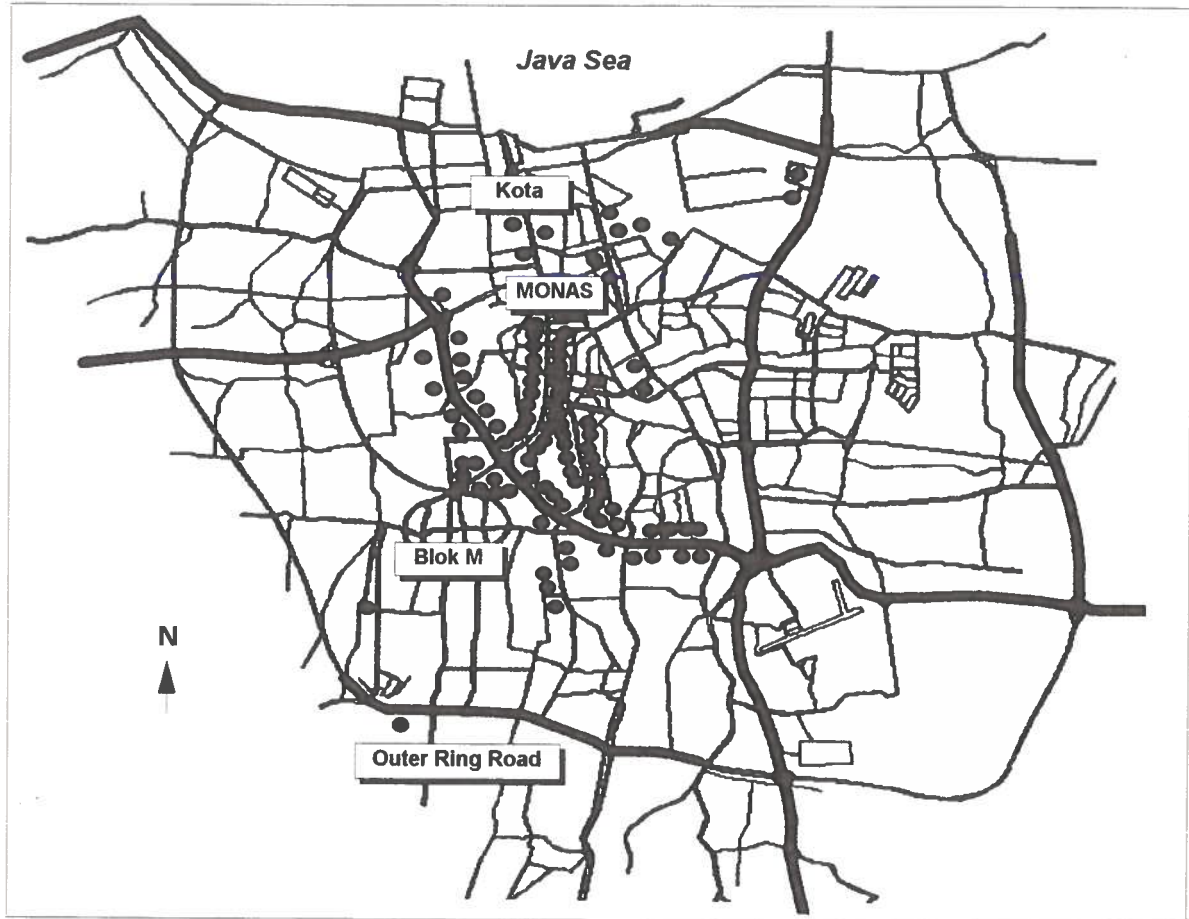
The primary sources for data on office-sector real estate markets in DKI Jakarta were *The Apartment, Office Space and Shopping Center Directory* (Pusat Data Properti Indonesia, 1996) and *Properti Indonesia* (Pusat Data Bisnis Indonesia, 1996).² From a total of 112 office properties in DKI Jakarta, reasonably complete data were available for 104 office buildings or sites in the region (see Figure 1). For each building or site, we were able to obtain information on full monthly asking rents. Since the reported asking rents did not normally include monthly expenses for special services (e.g., janitorial services), full asking rents were estimated by adding service expenses to non-service rents.³

Supplementing real estate data, locational and freeway proximity measures were developed for each of the 104 office sites by measuring straightline distances of each site to: (1) Monas, the historical and cultural center of Jakarta, situated between old-town Jakarta (Kota),

² This data source was supplemented by data compiled directly from 40 office properties. Telephone interviews were conducted to compile supplemental data.

³ Contract rents, which are the production of lease negotiations between individual tenants and landlords, are rarely reported in Indonesia, and can vary substantially from asking rents.

Figure 1. Surveyed Office Sites in DKI Jakarta



major government complexes, and major business centers to the south; and (2) proximity to the nearest limited-access freeway interchange, expressed in half kilometer distance increments. These straightline distance measures were supplemented by accessibility indices estimated for geographic clusters of office buildings. The accessibility indices measured the relative proximity of each office site to upper-middle and upper income households in the region, thus serving as an indicator of labor market accessibility. Since lower income groups are generally unlikely to be in the formal labor market for office employment, our analysis concentrated only on the upper income household strata.⁴ The accessibility index measure took the following form:

$$AI_j = \sum_{i=1}^n P_i D_{ij}^{-0.5} \quad \text{for } j = 1 \dots m \quad (1)$$

where: P_i = number of employed residents in middle and higher income categories (earning > US\$150 per month) in subregion i
 D_{ij} = straightline distance from centroid of subregion i to centroid of office cluster j
 m = number of (spatially defined) office clusters in the region
 n = number of residentially defined subregions

Because of housing shortages, many Jakartans to endure very long commute trips, meaning distance has a relatively small impedance effect on residential location. Thus, the coefficient on the distance variable (D_{ij}) -- -0.50 -- is fairly high (in absolute terms) by developed country standards. This coefficient value reflects the empirically measured impedance effect on commuting interchanges in DKI Jakarta, calculated using work-trip origin-destination data from several thousand travel diaries compiled in 1991 by the region's transportation planners. In order to remove the influence of original measurement units from the accessibility index, the AI_j values were standardized (i.e., expressed in terms of the number of standard deviations they lie from the mean accessibility index for all office buildings surveyed). It is these standardized values of AI_j that are presented in the analyses that follow.

⁴ While employable adults from lower income households might find janitorial and menial service jobs at office sites, it is unlikely that office developers would site their structures with reference to these low-end labor markets. In Indonesia, low-skilled, minimally educated individuals will endure long commuters to their workplaces in return for steady employment. Thus proximity to potential labor markets is thought to only have a locational influence with reference to the high skilled labor force.

4. Patterns of Labor Market Accessibility in Jakarta

Figure 2 summarizes the measured labor force accessibility index values calculated for 19 office clusters. The bar graph shown for each office cluster are interpreted as follows. The mean standardized accessibility index, zero, is displayed as the horizontal line for each graph. Standardized values above the mean represent clusters that are more accessible to upper income strata households than the typical office cluster. Negative values indicate the opposite. For example, the far northwest office cluster, Kota, is comparatively accessible to upper income workers -- 1.49 standard deviations above the regional average. The far northeast cluster, Sunter By pass, on the other hand, is comparatively inaccessible to the upper-income professional workforce -- 3.45 standard deviations below the mean.

Office clusters with the highest labor force accessibility are generally located in the region's core -- specifically, the Kota-Thamrin-Sudirman north-south axis. Scoring the highest, in terms of relative proximity to medium and high income households, is Senen, a commercial trading area situated relatively close to affluent core-area neighborhoods like Menteng and several prosperous mercantile areas. Office clusters with the lowest accessibility scores dot DKI Jakarta's periphery. Scoring the lowest are axial employment zones aligned along new freeways, notably Sunter By pass (in northeast Jakarta) and the new southern ring road. In general, small office buildings and retail services populate these corridors. It is notable that all office clusters south of Sudirman, Jakarta's fastest growing and most expensive office cluster, score negative accessibility values. While there are many households within close proximity of the peripheral office clusters, these are often lower income households whose workers do not qualify for white-collar jobs. Barring growth restrictions, more balanced growth could be expected over time as more and more professional workers seek to economize on commuting by moving closer to their workplaces.

Figure 2. Accessibility Index for 19 Office Clusters



5. Study Findings

Employing multiple regression analysis, two sets of models were estimated to explore the degree to which regional location and proximity to freeways get translated into office rents. One model expressed the location of each office site mainly with reference to Monas. This formulation can be thought of as studying office rents in a monocentric context -- in terms of relative proximity to a single, historical center. The second model employed the accessibility indices to measure relative proximity not to a single center, but rather to qualified labor markets spread throughout the region. Since multiple locales of potential labor pools are accounted for in this formula, this formulation allows us to study variations in rents from a polycentric perspective. As noted, a secondary purpose of our study was to assess the degree to which a monocentric or multi-center expression of accessibility provides the best predictions of capitalized office rents.

Table 1 summarizes the findings from the best fitting regression equations. Overall, the monocentric model outperformed the polycentric one. That is, controlling for other factors, office rents were more strongly a linear function of distance to Monas than relative proximity across multiple labor markets (as expressed by the accessibility index). The monocentric model's predictive power was 28 percent greater than the polycentric one (based on relative differences in r-square statistics and assuming the effects of omitted variables are the same for both models). This finding suggests that DKI Jakarta remains a largely dominant-centered metropolis, at least with reference to office rents and at this stage in the city's evolution. Past research of U.S. metropolitan areas has similarly found expressions frameworks to more strongly predict property values than multi-center ones (Mills, 1972).

Table 1. Regression Model of Office Rents in DKI Jakarta, Monocentric and Polycentric formulations

Dependent Variable: Full Asking Rent (in Rupiah per m² per month, in 1000s, 1996)

	Monocentric Model	Polycentric Model
On-site waste management and water systems (0-1)	2.547 ** (0.635)	2.695 ** (0.673)
Freeway interchange within 0.5 km (0-1)	2.964 ** (1.147)	2.715 * (1.301)
Freeway interchange within (0.5-1.0 km) (0-1)	2.477 ** (0.939)	1.743 * (0.970)
Freeway interchange within (1.0-2.5 km) (0-1)	2.334 ** (0.882)	1.314 (0.884)
Straightline distance to Monas (km)	-0.755 ** (0.159)	--
Accessibility Index	--	1.272 ** (0.339)
Summary of Statistics:		
F	10.189	7.127
Probability	0.000	0.000
R ²	0.342	0.267
n	104	104

Notes: ** significant at the 0.01 level

* significant at the 0.05 level

() values in brackets are standard errors

In estimating the models shown in Table 1, numerous variables related to features of office buildings and sites were considered, including building age, building plot ratios, parking provisions, and the existence of various amenities and services (e.g., back-up power generators, satellite communications, etc.). Besides variables related to regional location and proximity to freeway interchanges, the only other significant predictor that emerged was a dummy variable signify the availability of on-site waste management and supplementary water systems. Waste and water systems raised rents by around US\$1.15 to US\$1.23 (2,550-2,700 Rupiah) per m², holding all else constant. We had expected that other variables, like building age and amenity

levels, would have emerged as significant marginal predictors, but they did not. Part of the reason was that these non-included variables tended to be highly multicollinear with the regional location measures (e.g., accessibility and distance to Monas). Cross-sectional dummy variables that accounted for the unique locational market conditions of particular clusters generally improved model fits, however multi-collinearity with other locational predictors compromised the models when these dummies were added.

Table 1 reveals a strong capitalization effect with respect to the proximity of an office building to a freeway interchange. Given Jakarta's acute traffic congestion problems, this finding was expected. Based on the coefficients, capitalization effects decay exponentially with distance from the interchange -- i.e., rent premiums fell with distance at a decreasing rate. This well-defined step-down pattern bodes favorably for the possibility of delineating rent premiums, and thus for operationalizing some form of value capture. A literal interpretation of the coefficients from the best-fitting monocentric model says that, controlling for other factors, offices within a half kilometer of a freeway interchange rented for around US\$1.35 (2964 Rupiah) more per m² per month than office buildings located beyond 2.5 km of an interchange (the suppressed category for the multiple "freeway interchange" dummy variables). An equivalent building within comparable distance to Monas and located between a half and one kilometer away from an interchange would rent for US\$1.12 more per m² per month -- a US\$0.23 per m² per month difference.

5. Public Policy Responses

These findings lend credence to the principle of value capture as a legitimate and potentially promising source of transportation infrastructure financing in large cities of the developing world. Moving the principle from a conceptual to an implementation stage, however, remains a significant public policy challenge. Jakarta is actually not without precedent in implementing benefit assessments to pay for roads and infrastructure. Since 1972, DKI Jakarta has had a betterment tax, called Pajak Khusus, on the books. The tax allows city authorities to recover 60 percent of the estimated cost of new and improved infrastructure provided by regional

governments. To date, Pajak Khusus has been used mainly to finance road projects in 20 designated areas (Kelurahans) of DKI Jakarta, though in practice it has been collected in far fewer places.⁵ So far, Pajak Khusus has not lived up to its expectations. Overall receipts dropped sharply from US\$420,000 (0.3 of 1 percent of all locally collected tax revenues) in 1983 to under \$20,000 a year (or 0.07 of 1 percent of local tax receipts) during the early 1990s.

Jakarta's betterment tax system has suffered from poor administration, loose enforcement, and non-compliance. While tax objects (i.e., benefiting properties) could be easily identified based on the law, often tax subjects (i.e., legal landowners) could not. Confusion over residential land titles and difficulties in locating absentee landowners have undermined Pajak Khusus' effectiveness. Even when landowners are identifiable, Pajak Khusus has suffered from lax administration, such as delays in sending out tax payment notices, and corrupt practices among poorly paid civil servants charged with enforcing the program. Collecting money from low-income households has also been nearly impossible. While on paper landholders might be financially better off as a result of a road project, unless they sell their land or engage in commercially viable ventures which materially benefit from improved accessibility, many have no liquid assets or cash on hand to make payments. Residents also are generally reticent to pay betterment fees for infrastructure investments that are near them but which confer benefits to many others, such as improvements to nearby main arteries (Mohan, 1994). Overall, Pajak Khusus rates high as a local funding source for infrastructure development in terms of legitimacy and equity and low in terms of administration and ease of implementation. Its apparent demise owes more to administrative difficulties and institutional weaknesses than to any conceptual shortcomings.

⁵ An estimated 90 percent of Pajak Khusus tax revenues since 1980 have gone to road projects. The tax has also been applied to sewerage, drainage, bridge, water supply, and street lighting improvements -- i.e., any public works projects that are linear and aligned along a street right-of-way. The formula for levying Pajak Khusus attempts to apportion the tax to each land parcel based on that parcel's width in meters relative to the total lineal meters among all parcels which directly abut a new or improved road. Pajak Khusus is only to be paid once within a three year period following the completion of a project. Local laws call for penalties ranging from 25 percent to 100 percent of the tax bill should a property owner fail to make installment payments. However, authorities cannot collect back taxes because of a statute of limitations clause; after 3 years, unpaid taxes are no longer recoverable.

For these reasons, we would argue that the focus of betterment taxes in places like Jakarta should shift from residential neighborhoods to fast growing commercial districts. Our research suggests that the benefits of proximity to major transportation facilities, and more generally the benefits of high accessibility to skilled labor markets, get capitalized into land values in a measurable and meaningful way. Also, determining land titles and ownership would be far less of a problem for commercial properties vis-à-vis residential ones. Moreover, since high-value commercial parcels are far fewer in number, the institutional requirements of enforcing and collecting a betterment tax program would be less onerous. And in terms of ability-to-pay equity criteria, betterment taxes targeted at high-end office land uses would rate highly. While owners of valuable commercial properties tend to be wealthy individuals and families with considerable political clout, the potential accessibility gains accruing from major road improvements could be expected to eventually win the support of Jakarta's business elites for schemes like betterment taxes. Some might argue that targeting betterment taxes at Indonesia's corporate and industrial sectors would raise operating costs, particularly for knowledge-based sectors whose productivity partly depends on agglomeration economies and high accessibility. Higher land costs, some might charge, would place these sectors at a global disadvantage by lowering profitability. While there might be some negative short-term repercussions, over the long term the benefits of improved accessibility would more than offset the costs. That is, a well-designed and administered betterment tax that helps to finance a congestion-reducing and mobility-enhancing transportation system would over time increase economic productivity and thus, in the final analysis, increase Indonesia's global competitiveness.

In theory, ad valorem property taxes should be able to function, at least indirectly, as value-added taxes, recouping some of the financial gains created by public works investments. However, problems related to administering property taxes and valuing properties have so far precluded this. In Indonesia, property taxes, administered through a national ministry, PBB, would be unable to match the revenues generated through a properly administered betterment tax for several reasons. PBB's valuation methodology does not directly account for the benefits of a new road or acknowledge the effects of other infrastructure (like sidewalks or drainage) on land values. Also, as is the case in many developing countries (Bahl and Linn, 1992), assessment and tax rates are too low to achieve reasonable cost recovery. Currently, annual PBB tax bills are 0.1

of 1 percent of assessed market values. For any corridor, such a low effective tax rate would not come close to recovering the 60 percent of road construction costs that Pajak Khusus attempts to. One study of Guided Land Development in the Tangerang part of the Jabotabek region estimated that it would take about 142 years to recover 60 percent of the planned US\$1.5 million road and footpath construction costs through PBB receipts (Culpin Planning, 1990). Moreover, Pajak Khusus is a locally controlled tax whereas in Indonesia, PBB is administered and controlled by the central government. Thus, in Indonesia's case, the expansion of betterment taxes would be consonant with the national policy of decentralizing the responsibility for financing and implementing urban infrastructure. It is for all of these reasons that we believe a carefully designed betterment tax system, targeted at office land uses and high-end commercial properties, would provide an efficient and equitable means of financing badly needed transportation infrastructure development in fast growing megacities like Jakarta.

6. Conclusion

Accessibility to freeways appears to be strongly capitalized in Jakarta's office real estate market, with rent premiums decaying exponentially with distances to interchanges. This bodes well for value capture approaches to transportation infrastructure finance on theoretical grounds. Our analysis also showed that rents were more strongly a function of distance to Jakarta's historical center than a gravity-based measure of accessibility to upper-strata labor markets.

Because of past administrative and enforcement problems in implementing betterment tax financing of roads in Jakarta, we would argue for shifting the focus from residential properties to almost exclusively higher end commercial and office properties, at least in the near term. This is partly on efficiency grounds -- the greatest measurable capitalization benefits from improved accessibility are thought to exist for commercial and office properties. This shift is also grounded in administrative realities of Indonesia's centrally controlled property tax program. Because of incomplete land registration for residential properties, it is far easier to target, collect, and enforce betterment tax payments from commercial land uses for which land titles and registries are not in question. As land registration improves and land titling becomes more transparent, betterment tax financing might eventually be extended to residential properties as well. While other forms of road financing, like fuel surcharges, tolls, and registration fees, have

important roles to play in funding transportation infrastructure improvements, value capture should not be overlooked as a complementary beneficiary-based approach. In addition to generating sorely needed revenues, a side benefit of value capture programs is they would likely reduce land speculation, a pervasive problem in the land markets of rapidly growing megacities like Jakarta. By returning a portion of the value-added from road improvements to the public sector to help finance the investment, the potential windfalls from acquiring or holding on to properties near roadway interchanges are reduced. Given that a new light-rail metro system is presently under serious consideration in Jakarta, and that more miles of tollways (using build-operate-transfer, or BOT, schemes) are currently being built in metropolitan Jakarta than almost any place in the world, it is more imperative than ever that Indonesian officials seriously consider adding value capture programs to the current array of funding sources being used for transportation development and expansion.

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