Global Research Unit
Working Paper #2020-017

Land and Macroeconomics

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Abstract

This chapter sheds light on important relationships between land and macroeconomics. Given the broad nature of the topic involving land and macroeconomics to be discussed within a chapter, we pin down our attention on three related themes. In the first theme, we highlight how land influences macroeconomic variables like economic growth and development in the rural context. The second theme presents an overview of land dynamics on macroeconomics within the urban setup. Finally, we lay out new empirical evidence analysing how major land reforms in the world where end-users rights on land were transferred to the beneficiaries could usher in enhanced development through urbanization. The chapter concludes with pertinent policy choices and suggestions for future research.

JEL Classification Numbers: O11, O18, O47, Q15.

Key words: Rural land, urban land, property rights, land tenure, end-user rights, urbanization.

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This chapter sheds light on important relationships between land and macroeconomics. Given the broad nature of the topic involving land and macroeconomics to be discussed within a chapter, we pin down our attention on three related themes. In the first theme, we highlight how land influences macroeconomic variables like economic growth and development in the rural context. The second theme presents an overview of land dynamics on macroeconomics within the urban setup. Finally, we lay out new empirical evidence analysing how major land reforms in the world where end-users rights on land were transferred to the beneficiaries could usher in enhanced development through urbanization. The chapter concludes with pertinent policy choices and suggestions for future research.

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1. Introduction

How land is going to impact macroeconomic decisions? This question, though quite broad, remains very important for economists and policy makers alike given the fact that land is one of the fundamental factors of production. In both classical and neoclassical growth models (Lewis, 1954; Nichols, 1970), land plays an important role as a crucial input in the production process.[1] Generally, land is used as a static input in production from a macroeconomic perspective (stock variable) since land sizes are given within a country's geographical boundary. However, the distribution of land varies both within and across countries, and often these distributions are shaped by policy interventions like land reform (Lipton, 2009), land zoning (Rossi-Hansberg, 2004) and land redevelopment (mostly in urban setting) to name a few. Land usage also varies a lot within and across countries, where some lands are earmarked as agricultural land, fallow land, pasture land, forest land, and urban land.

In stages of growth, land plays an important role as initial growth of countries were primarily driven by agricultural sector growth, which is directly linked with land (Johnston and Mellor, 1961; Lewis, 1954). Nichols (1970) shows that savings could be bolstered with land holdings and associated price increase in land. This remains true for both urban and rural land, with urban land becoming more price sensitive as cities expand and rural land reaping the benefit of conversion of farmland to residential land as cities expand. Within a broader perspective, Hayami and Ruttan (1985) argue that agricultural growth is fundamental to economic development with the hypothesis that agricultural productivity growth is the key driver for agricultural output and subsequent economic growth. Given the fact that almost 75% people in the world, especially in the developing countries, are reliant on agricultural income (World Bank, 2008; Binswanger-Mkhize et al., 2009), it is of first order importance to understand how land plays critical roles in boosting income and growth over time in a number of countries across the world. In developing countries, often land is the only tangible asset which people may have that would give them the subsistence income both in the current period (*a la* Schultz, 1964) and in the future period. Thus, giving access and rights over land through land reforms became one of the fundamental policy decisions in the developing countries (Lipton, 2009; King, 1977) after the World War II.

A vast literature focuses on tenure security of land and its consequence on agricultural productivity and income (Arnot, Luckert and Boxall, 2011). The idea is that with improved tenure security, tenants will have the incentive to enhance agricultural productivity by applying more labour-intensive organic manures in land (Besley, 1995; Jacobi and Mansuri 2008). Land titles (an indicator of tenure security) can also be used as collaterals to obtain credits for improving agricultural investment (Feder, 1988). Similarly, enhanced tenure security in terms of land titles would stimulate land market transactions and lead to efficient allocation of land to willing farmers (Place, 2009; Deininger and Feder, 2001).

The emphasis on agricultural production stems from the fact that it reduces poverty (Christiaensen, Demery and Kuhl, 2011) and more so at very low level of development (Datt and Ravallion, 1996; Bourguignon and Morrison, 1998). It could also provide the capital necessary to finance growth in other sectors, like the industrial sector in the economy, through land tax revenues (Ghatak and Ingersent, 1984; Schiff and Valdez, 1992).

[1] If journal publication is considered an important indicator of academic knowledge pertaining to the field, then it is interesting to note that the *Land Economics* journal started publication in 1925.

1.1.Land and urban macroeconomic concepts

In addition to the channels mentioned above, land plays crucial roles in urban settings as well.[2] In urban areas, lands are needed for a number of reasons including organizing production (particularly industrial and manufacturing goods production like setting up factories etc), residential purpose, transportation, recreational use (urban parklands etc) and facilitating transactions in the services sector by setting up offices and workplaces. Evans (2004) concentrates on the economic theory of land market and highlights the importance of urban land supply for development. Leung (2004) and Leung and Ng (2019) provide nice overviews of the macroeconomic issues involving housing market. One pertinent concept in the urban economics in the broad sense is the nexus between housing prices and short-run business cycles in developed countries (Goodhart and Hofmann, 2008; Del Negro and Otrok, 2007; Leamer, 2007; Davis and Heathcote, 2005; Baxter, 1996; Greenwood and Hercowitz, 1991).

A number of recent studies focus on the land price dynamics and house prices. Nichols (1970) proves that savings could be bolstered with land holdings and associated price increase in land in the urban setting where urban land prices increase with expansion of cities. In an influential paper, Liu, Wang and Zha (2013) show that land price fluctuations are interlinked with macroeconomic volatility where land is used as a collateral in firms' credit constraints. Similarly, Davis and Heathcote (2007) find that house price fluctuations are primarily linked with land price dynamics across different locations in the US. Piazzesi and Snyder (2016) surveys the literature on housing and macroeconomics and find that land price increase was one of the primary factors for house price increase. There are heterogeneities in price increases, with lower land prices increasing at much faster rate than the already high land prices (Kuminoff and Pope, 2013), especially in the 2000s boom in the US. Focusing on a number of advanced economies, Knoll, Schularick and Steger (2017) report that house prices rose significantly after the World War II period in a number of industrial countries due to substantial increase in land prices. Thus, land plays an important role in determining house price dynamics, a very pertinent concept in macroeconomics.

1.2.The focus of the chapter

In this chapter, we concentrate on providing new evidence in relation to the above two topics focusing on transformation from rural setting to urban development. In particular, we investigate if particular types of land reform implementation involving rural land across the world could usher in enhanced urbanization over time. The specific reforms are the measures implemented with the motives of transferring end-user rights to land to the beneficiaries. Bhattacharya et al. (2019) document such major reforms across the world and we choose four of these focusing on transferring the end-user rights, *viz.*, (i) distribution of land, (ii) consolidation of rural land, (iii) privatization of mainly state owned farmlands and (iv) restitution of land.[3] The underlying idea is that these reforms would lead to possible land

[2] Just for our reference, the top field journal in urban economics, the *Journal of Urban Economics*, started publication in 1974. The *Journal of Housing Economics*, another journal focusing on housing economics in particular, started publishing in 1991.
[3] Additional details about these motives are provided in Section 5.

market development in future where willing buyers and sellers participate and land related transactions happen without any state or government dictate.

The land market development over time may lead to enhanced urbanization as reform beneficiaries have the option to quit farming altogether if they decide to do so with the marginal cost of farming becoming more than the marginal benefit attained. This sort of progression is also in line with the changes in the production structure of the economy where more emphasis will be given to industrial production and service sector activities over and above the agricultural sector as the economies progress. Thus, *a priori*, we would expect that end-user rights transfer motives would be positively related to urbanization, a proxy for urban development and economic growth (Nunn and Qian, 2011). On the other hand, as falsification exercises, we would expect that the reforms where end-user rights were not transferred, may not lead to such positive outcomes.

In the empirical strategy, we use a quasi-experimental setup and employ flexible event-study design and difference-in-differences technique to identify the causal effect of land reform implementation motives involving end-users rights transfer on urbanization. The empirical specifications control for pertinent factors influencing urbanization as failure to do so would lead to omitted variable bias. A number of falsification/placebo results are also presented to bolster the baseline findings. The results show overwhelming support to our conjectured hypothesis that end-user rights motives land reform implementations would lead to enhanced urbanization. In addition, the empirical analysis also uses novel data on nominal farmland price index reported in Knoll et al. (2017) for developed countries and find that the end-user rights focused land reforms played positive roles in enhancing farmland prices. This indicates plausible land market demand side mechanisms of such land reform implementations.

The rest of the chapter is organized in the following way. In the next section (Section 2), we discuss how land, economic growth and development issues are related by looking at the rural setting. Section 3 presents studies analysing links between land and urban indicators like house prices. In Section 4, we provide the rationale behind the new empirical evidence presented. Section 5 describes the underlying data and descriptive statistics. Section 6 elaborates the empirical strategy. All empirical results and discussions are presented in Section 7. Section 8 concludes the chapter after highlighting pertinent policy choices and avenues for future research.

Section 2. Land and macroeconomics: rural perspective

2.1. Land, agricultural productivity and growth

Land plays a crucial role in the agriculture driven growth in the early stages of economic development (Weil and Wilde, 2009). Bezemer and Heady (2008) provides a nice overview of how agriculture drives economic growth. There is, however, considerable debate regarding the importance of agriculture in enhancing growth (Tsakok and Gardner, 2007; Valdes and Foster 2010). One set of studies like Tiffin and Irz (2006), Timmer (2008) and Gollin, Parente and Rogerson (2002) find that the agriculture sector is fundamental to development and economic growth by enhancing value-added in agriculture and improving the gross domestic product in a number of countries across the world.

There are a number of channels through which agricultural productivity could be improved. The first channel would be more investment in land by providing more inputs in the

production process including inputs like organic manures. Besley (1995) and Jacobi and Mansuri (2008) proxy one particular investment in land with the 'use of farmyard manure' as the empirical measure of investment in case of Ghana and Pakistan, respectively. These enhanced investments, in turn, are linked with improved property rights over land with the intuition that increased property rights over land provide incentives for farmers to investment more in lands they formally own and have end-user rights. Goldstein and Udry (2008) investigate this particular channel in Ghana and find that people with more local level political connections have more access to secure property rights over land, and, subsequently, they invest more in their lands to improve productivity and associated income. There are a number of studies showing that incomplete property rights over land lead to under-investment in agricultural land (Jacobi and Mansuri, 2008; Jacobi, Li and Rozelle, 2002; Besley, 1995). Note that Johnston and Mellor (1961) also mention about improved land secure security as a precondition for the development of the agricultural sector.

Second, agricultural productivity could be improved by a spurt in agricultural investment through increased borrowing with land as a collateral if there is perfect tenure security over land (Feder, 1988). In such instances, land plays the role of tangible asset based on which more credit can be obtained to improve agricultural investment (Croppenstedt et al., 2003; Dethier and Effenberger, 2011; Besley and Ghatak, 2010).

Third, productivity could be improved by facilitating land market transactions, where willing buyers and sellers participate in the land market without any government intervention (Deininger et al., 2017). These market mechanisms would work effectively in situations where property rights over land is well defined and end-user rights are given via land titling. In addition, such transactions would bode well for land rental markets (Jin and Jayne, 2013; Holden et al., 2008).

On the contrary, papers by Ban, Moon and Perkins (1980) and Fane and Warr (2003) do not find the supremacy of the agricultural sector in fostering economic growth in South Korea and Indonesia, respectively. Gardner (2005) also supports the above with a cross-country study of 85 countries.

2.2. Land tenure security and its impact on growth and development

Given the importance of land tenure security on agricultural productivity, it would be good to analyse how tenure security would affect the productivity. Arnot, Luckert and Boxall (2011) provide an interesting overview of studies on tenure security. Arnot et al. (2011) posit that both the content and assurance aspects of tenures should be looked into carefully, but also clarify that the content angle is empirically more tractable with measures like legal title to land (Smith, 2004; Feder and Onchan, 1987). The type of tenure is also used as a proxy for tenure in a number of studies (Carter and Olinto, 2003; Gavian and Fafchamps, 1996; Otsuka et al., 2001; Place and Otsuka, 2002).

In the short-run, having user rights will lead to more productive use of land simply because the land owner has the absolute ownership and could adopt more productive technologies to increase output/production without the fear of losing/usurping the final product. From the landowners' perspective, this brings in guaranteed income earning scheme. Indeed, there is a voluminous literature documenting that agricultural output and productivity increased after successful implementation of land reforms (Bardhan and Mookherjee, 2007).

In the long-run, the end-user rights will enable land market related transactions with end-users beneficiaries free to sell or buy land in the market without unnecessary state or government interventions (Land Tenure and Property Rights Regional Reports, 2008). These will probably usher in more investments in land by using land as collaterals to obtain credits (Arnot, Luckert and Boxall, 2011). The property rights in land follow a huge literature which harps on the importance of property rights in general for bolstering economic growth (Bohn and Deacon, 2000; Persson and Tabellini, 1994; Levine and Renelt 1992; Barro 1991).

2.3. Recent findings on agriculture and aggregate productivity

In a series of influential papers, Restuccia et al. (2008), Adamopoulos and Restuccia (2014) and Adamopoulos and Restuccia (2020) analyse potential factors affecting productivity in agriculture. They find distortion in allocation of factor inputs in agriculture has the profound impact on productivity. One of the candidate explanation for such disruption is the higher cost of inputs like fertilizers which could be high due to domestic production restrictions as well as higher import restrictions of such inputs (Restuccia et al., 2008). The other explanation boils down to restrictions on labor mobility (Restuccia et al. 2008) which may not be of that much importance from developing countries like India where there is substantial labor mobility across states during agricultural seasons. Moreover, some additional channels of distortions are scalability in regards to farm-size (Adamopoulos and Restuccia, 2014) and inefficiency in the land market transactions (Adamopoulos and Restuccia, 2020). This chapter's focus could be linked with the above papers by saying that land as an important factor input could have been better allocated if there were end-user rights over land. In fact, Adamopoulos and Restuccia (2020) show that embarking on land reforms in absence of proper land market institutions could actually lead to substantial decline in agricultural productivity, as happened in Philippines.

Section 3. Land and macroeconomics: urban connections

In this section, we briefly overview concepts involving land and macroeconomics from an urban perspective. Within urban economics field, the house prices and their dynamics play the most vital role, and especially after the sub-prime lending crisis and the associated global financial crisis in 2008-2009, understanding house price dynamics and relevant factors became one of the focal points in macroeconomic research agenda (Jordà, Schularick, and Taylor, 2015; Adam and Woodford, 2013). Thus, it is no wonder that there are a number of detailed surveys which cover housing and macroeconomics in general (Leung 2004), housing and macroeconomic issues focusing on land dynamics (Piazzesi and Snyder 2016) as well as drivers of house prices and factors affecting interconnected economic activities like credit markets, house price expectations, and financial stability (Duca et al. 2020).

Nichols (1970) is one of the first studies showing that savings could be bolstered with land holdings and associated price increase in urban land where land prices increase with expansion of cities. In an influential paper, Liu, Wang and Zha (2013) show that land price fluctuations are interlinked with macroeconomic volatility where land is used as a collateral in firms' credit constraints. Similarly, Davis and Heathcote (2007) show that house price fluctuations are primarily linked with land price dynamics across different locations in the US. Piazzesi and Snyder (2016) surveys the literature on housing and macroeconomics and find that land price increase was one of the primary factors for house price increase. There

are heterogeneities in price increases, with lower land prices increasing at much faster rate than the already high land prices (Kuminoff and Pope 2013), especially in the 2000s boom in the US. Knoll, Schularick and Steger (2017) report that real (CPI adjusted) house prices rose significantly after the World War II period in a number of industrial countries due to substantial increase in the residential land prices.[4] Knoll et al. (2017) finding echoes with results from Gyourko, Mayer, and Sinai (2013) and Glaeser and Ward (2009).

Section 4. Land reforms with end-user rights transferred and their potential impact on urbanization: empirical hypotheses

Given the overview of how land plays important roles in both rural and urban settings, it would be interesting to investigate if decisions like major land reforms implementations would usher in increased urbanization, an important indicator of growth and development in the extant literature. Land reforms are very effective in improving agricultural productivity and rural income in a number of countries (de Janvry et al., 2015) and there are numerous country-level studies showing the positive impact of land reform in reducing poverty in India (Besley and Burgess, 2000), Ghana (Besley, 1995), and China (Deininger et al., 2007) to name a few.

Place (2009) provides an excellent overview of land tenures in the context of Africa and finds that the enhancing tenure decisions may have beneficial impacts on agricultural productivity depending on the underlying macroeconomic conditions within which the tenures operate. One of the crucial channels of improving agricultural productivity is through increased investment in agricultural land when there is secure land tenure rights (Goldstein and Udry, 2008). This follows a vast literature (De Soto, 2000; North and Thomas, 1973) focusing on the importance of well-defined and secure property rights over land necessary for economic development.

In line with the above, we analyse the impact of a particular set of land reforms where end-users rights in land were transferred to the beneficiaries. The investigation is based on the conjecture that properly transferred end-user rights will usher in land market transactions, which, in turn, would hasten economic growth and development.

We use urbanization as the empirical measure for development. This is a widely used proxy for economic development and growth in a number of recent studies (Nunn and Qian, 2011). Nunn and Qian (2011) point that urbanization and per capita income are closely interlinked based on the studies by Acemoglu, Johnson, and Robinson (2005), Acemoglu, Johnson, and Robinson (2002) and DeLong and Shleifer (1993). Thus, urbanization could be used as an outcome or dependent variable.

Given that the focus is on land reforms which are transferring end-user rights in rural land and ushering in probable land market transactions across rural and urban settings, we would like to have an outcome variable which resonates closely with the transition process. Urbanization, measured as the proportion of urban population to the total population, will be a good outcome variable as it shows the propensity to transfer to more urban setup if the urban population is growing more in comparison to the total population. Taking a quick look

[4] The countries are: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom and the United States of America.

at the data, we find overwhelming support that the urbanization is growing over the years across all countries in the data sample. Thus, one testable hypothesis will be the positive incentive for urbanization if end-user rights are transferred, *ceteris paribus*.

In addition, we also use the nominal agricultural farmland price index from Knoll et al. (2017) as another outcome variable. Knoll et al. (2017) report farmland prices for 11 advanced countries only, thus, restricting our analysis to a handful of developed economies. Though constrained in terms of sample size, the outcome variable suits our intuition in regards to land market development due to end-user rights being transferred to beneficiaries. With end-users rights, the beneficiaries have the opportunity to participate in the land market by buying and selling land based on the market demand and supply dynamics. If the supply side of land is determined by the arable land area, then we think that end-users rights will encourage the demand side of the market as more willing beneficiaries participate in that market. They may demand more land as they can invest more or trying to scale up their production or they can sell land if the marginal cost of production remains too high to match up the marginal benefit. Thus, if we could control for supply side factors by looking at the arable land area in particular and the number of rural people in general, then *a priori*, end-user rights transferring land reform would enhance the prices of farmland. This is an additional hypothesis which could be tested in the empirical analysis.

Section 5. Data and Descriptive Statistics

5.1. Dependent variable

The main outcome variable is urbanization, which is measured as the proportion of urban population in total population. We use urbanization in logarithmic scale as the dependent variable with the relevant data collated from the World Development Indicators of the World Bank. Later, in another empirical specification (described below), the nominal price index of farmland prices from Knoll et al (2017) is employed as another dependent variable to test our second hypothesis.

5.2. Explanatory variables: major land reform implementations

The land reform implementation variables are from the major land reform dataset compiled at the world level by Bhattacharya et al. (2019).[5] The reforms are categorized as major if these measures (land reform acts) changed the agrarian structure of the economy substantially by setting new directions and changing rules for land ownership, land tenure and land user rights. Bhattacharya et al. (2019) categorized 12 different motives of land reform, out of which, four of the following are of particular interest for us in the empirical analysis as they transfer the end-user rights to land to the beneficiaries.

(a) Distribution: This is listed as a major reform where the land title is transferred to the new owner. In particular, the transfer of the ownership or end-user rights of state lands to beneficiaries is classified as distribution motive of the land reform. Distribution generally takes place by giving empty public lands to the landless (or land-poor) as part of traditional land reforms. However, in some countries, previously uninhabited lands may be given to colonizers or squatters (Paraguay 1904; Brazil

[5] The following discussion on land reform dataset relies heavily on the data appendix accompanying the Bhattacharya et al. (2009) paper.

1964 and 1998) as part of land settlement programmes. We consider both of the above cases as distribution. In regards to formerly communist countries, transfer of the former collective lands to ordinary people (former workers) are also listed as distribution since end-users rights were given to the beneficiaries (Albania 1991 and Armenia 1991).

(b) Consolidation: The consolidation objective also transferrs the end-user rights to beneficiaries and generally spans the European region. However, a number of developing countries like India (1953, 1960, and 1970) Rwanda (2005) and Turkey (1984) also employed this land reform motive. Early consolidation efforts in Europe can be traced back to the 14th century (Bavaria 1353) and some consolidation efforts that were initiated in the 19th century spilled over to the 20th century (e.g., Austria 1899). In traditonal sense, consolidation refers to re-parcelling of fragmented lands into unitary land blocks. In such instances, farmers retain their ownership and tenure rights with consolidation aimed at improving their land use. Consolidation may occur through agreement, enforcement, or could have a national or regional scope (Portugal's 1962 reform was concentrated on the country's northwest); however, we did not distinguish these in our coding. The modern consolidation paradigm encompasses rural integrated development steps, where land use is enhanced through irrigation, new roads, soil conservation and other infrastructure development. We list both traditional and modern consolidation concepts as a single consolidation motive.

(c) Privatization: Privatization is another case of transfer of user-rights which refers to the sale of state-owned farmlands to the beneficiaries. Typically a dissolution method of the collectivist mode of agriculture, privatization is used in some of the erstwhile socialist countries (Bulgaria 1991, Czechoslovakia 1991, Poland 1991) in combination with other forms of dissolution. In some cases, the law may enable the parliament to sell the lands with religious importance (Israel 2009). In other instances, the state could sell previously expropriated lands as happened in Taiwan in 1951 and again in 1953 involving the former Japanese-owned lands.

(d) Restitution: Restitution is the last case of the transfer of end-users rights motive in our empirical analysis. Under restitution, the state/authority returned the previously collectivized lands or similar size of lands back to their former owners or their descendants following the collapse of communism (Bulgaria, Czechia, Estonia, Latvia, Lithuania, Romania). However, several countries did not elect to restitute collectivized lands, or restituted them only partially. In some instances, the collectivized lands had no claimants even though they were offered to be restituted (e.g., Estonia 1991). On the contrary, quite a few formerly communist countries collectivized lands only minimally during communism (Poland). In other cases, previously nationalized/expropriated (not necessarily collectivized) lands were returned by the state/authority with the transfer of end-user rights to beneficiaries (Algeria 1990 and South Africa 1994).

(e) Combination of above four motives: In the empirical analysis, we also included another motive, which is the combination of the above four end-user motives and use

this as another combined category of end-user rights transferred motive. The idea is that the combination of all four end-user rights transfer motives would give us a uniform, over-encompassing picture of the end-user rights being transferred to the beneficiaries.

In addition, a number of falsification exercises are also presented with major land reform implementations motives where end-user rights were not transferred to the beneficiaries. These are briefly outline below.

(i) Tenure security improvement: The tenure security improvement is in relation to tillers of the land (tenants and/or sharecroppers) with the key feature that the land title rests with the land owner, and not to the tenant and/or sharecropper. However, the tenants could still make their own private and long-term decisions on agricultural activity with the security they receive. Landowner could also be the state, where the state gives greater tenure security to farmers (Ethiopia 1997), provides extended lease (Georgia 1998, Croatia 1991, Israel 1960), or gives the opportunity of land-sharing (Moldova 1991; Russia 1990). As examples of greater tenure security in which the land is owned by private persons, Europe exhibits several tenure security improvement acts that gave tenants more rights with longer term lease contracts and enabling faster land dispute claims (France 1946, Netherlands 1937 and 1958).[6]

(ii) Recognition of customary/indigenous/community/religious/traditional (CICRT) land rights: This particular land reform motive does not involve transfer of end-user rights to land to the beneficiaries; rather, the recognition of CICRT rights aims at formalizing the previously informal land rights, and moving the CICRT lands into the formal sector. Recognition of CICRT land rights has the potential to improve farmers' decision making in agricultural activity. In a number of countries, especially in the developing world, informal rights to land could exist collectively or privately. The key difference between these is that the former refers to collective rights under customary, indigenous, community, religious, as well as traditional rules, while the latter refers to informal private individual/household rights. The law may recognize either CICRT ownership rights (Niger 1961) or only private rights (Mozambique 1997). We coded both of the recognitions as CICRT rights.

(iii) Pro-poor land reform: This particular set of land reform is primarily targeted at the poor beneficiaries without transferring the end-user rights. Specifically, an act or directive deemed to be pro-poor if it was specifically targeted for the poor or if one of the major beneficiaries was the poor. In particular, an act or directive is listed as pro-poor if the source documentation mentions one of the following keyword regarding the targets and beneficiaries of the reform: "landless; poor; landless agricultural labor; bonded labor; marginal farmers; reduce poverty; peasants; subsistence peasants; subsistence farmers". In addition, we also considered the squatters as poor (Costa Rica 1961 and Jamaica 1968).[7]

[6] Additional information regarding this particular motive is in Bhattacharya et al. (2019) paper's appendix.
[7] Please refer to the Bhattacharya et al. (2019) paper's appendix for more information regarding this specific category of land reform.

(iv) Combination of three motives, landholding ceiling imposition, expropriation and redistribution: In the last falsification check, we combine three motives from the Bhattacharya et al. (2019) paper, which are often used together in implementation. The first motive imposes upper ceiling on the quantity of land to be held by the landlords primarily in the context of developing countries in Africa (e.g., Namibia 1995, Somalia 1975), Latin America (e.g., Bolivia 1953, Brazil 1964, Cuba 1959, Dominican Republic 1962) and South Asia (e.g., Japan 1946, Taiwan 1953, China 1947 and South Korea 1950). The land holding ceiling imposition is done to smooth out highly unequal land ownership between the landlords and intended beneficiaries without transferring the land user-rights. The second motive of expropriation involves confiscation of private lands from landlords (excluding confiscation of land for collective or communism type decision making) above the imposed ceilings with or without compensation. The third motive, redistribution, generally takes places after land ceiling imposition and expropriation with the confiscated/expropriated lands taken over and above the upper ceiling being transferred to the poor by the ruler/state. Interestingly, redistribution also comes with the transfer of end-users rights to land. However, since the above three motives are used together with the first two motives (landholding ceiling imposition and expropriation) where end-users rights were not transferred, we use the combination of above three together as a combined motive treating it as one where end-user rights were not transferred fully.

5.3. Control variables

We use a number of control variables from the extant literature (Nunn and Qian, 2011). The first specification (outlined in the next section on empirical strategy) controls for pertinent variables for urbanization, namely, number of people in the urban area and urban population growth which are directly linked with the outcome variable as increasing urban population means increasing urbanization. Similarly, urban population growth rate is going to determine the proportion of urban population in the total population. These two variables are collated from the World Development Indicators of the World Bank. In addition, we also control for the gross agricultural production index from the Food and Agricultural Organization (FAO) statistical database with the intuition that more agricultural production would indicate more agricultural income earning opportunity, and thus, would limit the propensity to urbanize.

In the second specification (more information is provided in the next section) involving nominal farmland price index from a set of developed countries as outcome variables, we control for two key variables: (1) the arable land area as it signals the effective land available for cultivation and could be interpreted as the supply side indicator of the land market, (2) the level of rural population (in logarithmic scale) with the idea that the level of rural population would have a positive bearing on the farmland prices as more rural population means increased pressure on farmland. The arable land area is taken from the FAO website and the rural population numbers are from the World Development Indicators of the World Bank.

5.4. Descriptive statistics

Table 1 provides the descriptive statistics for all variables used in the empirical analysis.

Table 1. Descriptive statistics

Variables	Mean	Std. deviation	Minimum	Maximum	Observations

Dependent variables					
Urbanization	49.749	24.854	2.077	100.000	9864
Nominal farmland price index	62.124	75.119	0.0001	547.5	846
Independent variables (land reform implementation motives)					
Distribution	0.083	0.274	0	1	19502
Consolidation	0.046	0.211	0	1	19502
Privatization	0.021	0.144	0	1	19502
Restitution	0.010	0.100	0	1	19502
Combined end-user motive	0.137	0.344	0	1	19502
Tenure security imp.	0.129	0.335	0	1	19502
CICRT recog.	0.045	0.208	0	1	19502
Pro-poor	0.188	0.391	0	1	19502
Combined motive of land ceiling, expropriation & redistribution	0.196	0.397	0	1	19502
Control variables					
Urban popln.	127,000,00	402,000,00	8029	761,000,000	9861
Urban popln. growth rate	3.086	3.181	-187.142	48.935	9860
Gross agri. prodn. index	81.946	51.754	5.67	1104.66	8871
Arable land area	7517.14	22293.88	0.2	189244	8792
Rural popln.	165,000,00	754,000,00	2159	881,000,000	9612

Note: Urbanization is measured as the proportion of urban people in total population. 'recog.' refers to recognition. 'popln.' stands for population. 'prodn.' denotes production. Arable land area is in 1000ha. The land reform motives take the value of 1 from the year onward they are implemented; else, the motives are counted as 0.

A quick glance at the descriptive statistics reveals the sample size difference in terms of the dependent and control variables with respect to the independent variables. This is due to the fact that most of the dependent and control variables are from 1960 onward, whereas, the independent variables start from 1900 and spans the whole 19th century and the first decade of the 20th century (1900 – 2010). However, this will not have any bearing on the empirical analysis as we will be looking at the effect of implementation once it is done, and often this would cover the post-1960 period.

Taking a look at the independent variables, we see considerable heterogeneity in regards to their diagnostics. The land reform implementation with end-users rights transferred show the mean hovering between 0.01 (restitution) and 0.08 (distribution), pointing towards more distribution specific implementation in comparison to the restitutions. Interestingly, the combination of all four end-user motives depict a healthy mean of 0.137, which is even higher than the tenure security improvement motive mean of 0.129. Note that tenure security

improvement is used as a falsification exercise motive. In this connection, note that the combined motive of land ceiling imposition, expropriation and redistribution reveals the highest mean of 0.196 amongst all the land reform motives used in the analysis. This means that this particular combined motive is used quite frequently in the data sample. Thus, a falsification exercise involving this particular land reform variable could reveal the largest negative effect in the ensuing empirical analysis.

Section 6. Empirical strategy

We will be using the land reforms as exogenous shocks in a quasi-experimental setup with the idea that these sorts of reforms are path-breaking, significant changes and they do not occur quite frequently. We exploit the variation in major land reform implementations over time across countries noting the fact that different countries at different points in time implemented major land reforms.[8] In addition, there are heterogeneities in regards to motives of land reforms being implemented, viz., some land reforms give end-user rights to the reform beneficiaries such as the reforms focusing on land distribution, land consolidation, privatization of state owned lands and land restitution. In contrast, land reforms, where improving tenure security was the main aim and land reforms which formally recognized informal land transaction decisions through community, indigenous, and religious norms, the end-user rights were not given to the beneficiaries. Thus, and as hypothesized earlier (see Section 4), one would expect to see marked differences between outcome variables if end-user rights were fully transferred versus reforms where end-user rights were not considered at all. The intuition is to identify causal effect of these differential motives of land reforms by looking at the significant breaks in the outcome variables after implementation.

One could use a traditional difference-in-differences (DiD) estimator to identify causal effect of major land reform implementation on the outcome variables. However, the traditional, single coefficient DiD estimator is effective when the treatment (in this case, the land reform implementation) occurs only once, between the pre-period and post-period, and thus generating fixed treated and control units or countries (Goodman-Bacon, 2018). If the treatment varies over time, i.e., some countries implementing land reform at time t, whereas, some other countries implementing land reform at time t+n, where n could be 1 or 50 or 70 or 90 (for instance, the first major land reform implementation in the USA occurred in 1902; but in Canada, one of the closest neighbour of the USA, the first major land reform implementation occurred in 1973), or quite distance past, then, this could be viewed as multiple treatments or experiments (Goodman-Bacon, 2018). In such instances, already treated countries could be seen as controls for later treated countries since their treatment status did not change. But, with changes in treatment effects or land reform implementations over time, these get subtracted from the DiD estimate, leading to biased results in the single coefficient DiD estimates (Goodman-Bacon, 2018).

6.1. Baseline model

To alleviate such concerns involving single coefficient DiD estimators, we employ a flexible event study model as in Jacobson, LaLonde and Sullivan (1993) and in Bhalotra, Clarke, Gomes and Venkataramani (2019):

[8] There are instances where countries implemented more than one particular land reforms over the 1900 – 2010 time period. However, we are using only the very first land reform implementation in the empirical analysis.

$$Y_{it} = \alpha + \sum_{j=2}^{10} \beta_j^{lead} LR_i \times 1\{lead_t = j\} + \sum_{m=0}^{15} \beta_m^{lag} LR_i \times 1\{lag_t = m\} + \boldsymbol{\delta}.\boldsymbol{Z}_{it} + \varphi_i + \sigma_t + \varepsilon_{it} \quad \text{Equation (1)}$$

where, the main outcome variable, Y_{it}, is urbanization (measured as the proportion of urban population in total population) in country *i* at time *t*. The main independent variable is denoted by LR, which represents land reform implementation at country *i*. LR takes the value of 1 if a country ever implemented a particular kind of land reform, and using the event study design, we interact this land reform with a set of leads and lags based on the year the land reform was implemented. We use 10 periods for leads and 15 periods for lags keeping in mind that these major land reform implementations are not occurring very frequently, and, thus, deciphering the impact of a particular land reform implementation within a period of 10 years before and 15 years after will be a reasonable timeframe to analyse its impact on the outcome variable.[9] In the baseline model, we are also using appropriate controls (denoted by $\boldsymbol{Z}_{it}$) to address possible omitted variable bias.

These controls include urban population, growth rate of urban population and, importantly, an index of agricultural production, which measures the value of gross agricultural production in countries over time. Note that the agricultural production would be influenced by factors like inputs used, soil quality, level of mechanization, access to credit etc. As agricultural production increases, so do the income earning opportunity from tilling the land, and, this may discourage people from moving to the urban areas in search of livelihoods. Thus, agricultural production would act as a deterrent towards urbanization. In addition, we also control for unobservable factors using country fixed effects (φ_i) and year fixed effects (σ_t). All standard errors are clustered at the country-level following the suggestion of Bertrand, Duflo and Mullainathan (2004).

The coefficients of interest will be the estimates of β^{lag} as they would capture the effects after land reform implementations. The lead variables could check and test for any pre-trends which are very important in the underlying identification assumption of no parallel pre-trends (Bhalotra et al., 2019).[10] Freyaldenhoven et al. (2019) point that the absence of such pre-trends will be taken as a test of exogeneity of the policy variable, which is the land reform implementation in our context (described in detail in the next paragraph). Note that this test would be judged as partial as it can only identify parallel pre-trends but could not actually test for counterfactuals (Bhalotra et al., 2019; Kahn-Lang and Lang, 2018).

Our main independent variables involve land reform implementations where full end-user rights were transferred to the beneficiaries. Since full end-user rights could accentuate land market related transactions, amongst other alternatives, we expect that these implementations would spurt the urbanization incentives. Thus, we anticipate that the lagged estimates will be positive and significant after the implementation years for these particular land reform motives. We use five particular land reform implementation motives involving transfer of end-user rights from the Bhattacharya et al. (2019) paper, viz., (a) distribution of state-owned lands to the beneficiaries, (b) consolidation of private lands, (c) privatization of state-owned farmlands, (d) restitution of lands and (e) a combination of the above four motives together to

[9] We used different lags and leads combinations as alternative checks and the findings remain qualitatively similar. These results are available upon request.
[10] The first lead is omitted as the baseline category.

decipher the overall impact of such land reforms.[11] Taking option (e) where we are pooling together a number of different categories of motives is prudent given the fact that this would give us a broad, overall picture of the land reform policies implemented to transfer end-users rights.

Since we envisage that end-user rights on land would lead to more urbanization, we provide a number of falsification or placebo results with alternative land reform implementation motives where end-user rights were not transferred to the beneficiaries. These are: (i) land reform implementation with tenure security improvement as the only motive, (ii) land reform implementation where the motive is to legally recognize informal land related transactions using community norms, indigenous procedures, as well as religious beliefs, (iii) land reforms which were targeted explicitly to the rural poor and (iv) land reforms which are implemented with the motives of imposing land ceilings, expropriation and redistribution. The (iv) is treated as a combined motive as often times, the redistributive land reforms follow the staged process of imposing land ceilings first, followed by expropriation with or without compensating the landholders from where lands are expropriated over the stipulated land ceilings and lastly, redistribution of expropriated land to the intended beneficiaries. In these (i) to (iv) instances, we expect either muted or negative effects on the outcome variable, urbanization.

6.2. Two-way Difference-in-Differences model

After reporting the above flexible event study estimates, we also provide estimates from the two-way DiD model keeping in mind that the DiD estimates reported may not be unbiased due to the change in implementation variable over time across countries as mentioned in sub-section 6.1 above. Thus, in all likelihood, the DiD estimates will be under-reporting the true impact of the land reform implementation variables. Nevertheless, the DiD estimates will provide important effects in regards to the magnitudes of the land reform implementations undertaken. In these specifications, the independent variable (land reform implementation) takes the value 1 from the year or time period the land reform is implemented till the end of the data sample; else, it takes the value 0. Similar to Equation (1) above, this model is also estimated with appropriate controls, country specific fixed effects, time effects and the standard errors are clustered at the country-level.

6.3. Additional specification

Later, we use the following specification to decipher the impact of land reform implementation involving end-user rights on land prices for 11 developed countries from the Knoll et al. (2017) paper. We employ the nominal farmland price index as the land price variable from the above paper as the outcome variable.

$$LP_{it} = \theta + \sum_{g=2}^{10} \lambda_g^{lead} LR_i \times 1\{lead_t = g\} + \sum_{h=0}^{15} \lambda_h^{lag} LR_i \times 1\{lag_t = h\} + \boldsymbol{\Psi}.\boldsymbol{M}_{it} + \pi_i + \mu_t + \gamma_{it} \quad \text{Equation (2)}$$

[11] Note that Bhattacharya et al. (2019) paper also documents that redistributive land reforms were also implemented with the transfer of end-user rights. However, given that fact that redistributive land reforms were often implemented with two other land reform motives, viz., imposing land holding ceilings, and expropriating the surplus land beyond such ceilings which were subsequently redistributed, we are not treating the redistributive land reform as a separate category with exclusive end-users rights transferred in the analysis.

where, LP stands for the nominal index of farmland prices from the Knoll et al. (2017) paper mentioned above. Similar to the Equation (1) earlier, the coefficients of interests will be the λ^{lag} estimates as these would capture the effect of post land reform implementations on the land prices. With end-user rights in land, there is a possibility of improved land market transactions and this would be captured by the positive impact on land prices for farmlands. The intuition is that end-user rights will either signal or facilitate easy transactions involving lands as willing buyers and sellers would be able to buy or sell land when needed. In such instances, we could interpret end-users rights as facilitating or creating demand in the land market, and as a result, the prices are going to shore up over time in countries where such reforms are implemented.

In regards to the supply side of land market, we control for the arable land area as it signals the effective land available for cultivation. This will have primary impact on the rural land or farmland prices. We expect the estimates associated with the arable land area to be negative, especially when the rural farmland prices are used as the dependent variable. In addition, the level of rural population (in logarithmic scale) is used as another control variable with the idea that the level of rural population would have a bearing on the farmland prices. The *a-priori* expectation is that the number of rural people will influence rural farmland prices positively. Moreover, similar to the Equation (1) above, the unobserved heterogeneities are addressed with country and year fixed effects and the standard errors are clustered at the country-level.

Given the nature of land reform implementation in developed countries with end-user rights (primarily consolidation and very few privatizations), we will provide results with two different motives of implementation, (i) consolidation and (ii) combined end-user motive. No falsification results could be presented either due to the nature of land reform motives implemented in these developed countries.

Section 7. Results and discussions

7.1. Main results: the impact of various end-user rights motives land reform implementation on urbanization

The following figures present results from Equation (1) above where we concentrate on the impact of land reform implementations where end-users rights were transferred on the outcome variable of interest, urbanization.

Figure 1. The impact of distributive motive land reform implementation on urbanization

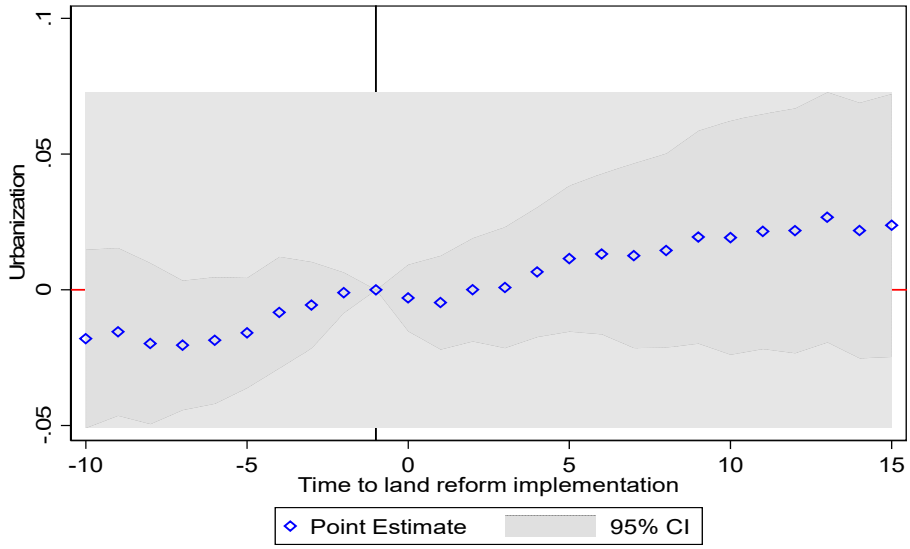


Figure 1 above shows some support to the postulated hypothesis that land reform implementation with distribution motive where end-users rights are transferred, are associated with higher urbanization, especially after five-years onward. Thus, distribution motive plays a role in ushering in urbanization, and this could be attributed to possible land market related transactions taking place after transferring end-user rights in such implementations. There appears to be no as such pre-trends looking at the period before the land reform implementation, so the identification strategy mentioned in the sub-section 6.1. above seems to be working.

Figure 2. The impact of consolidation motive land reform implementation on urbanization

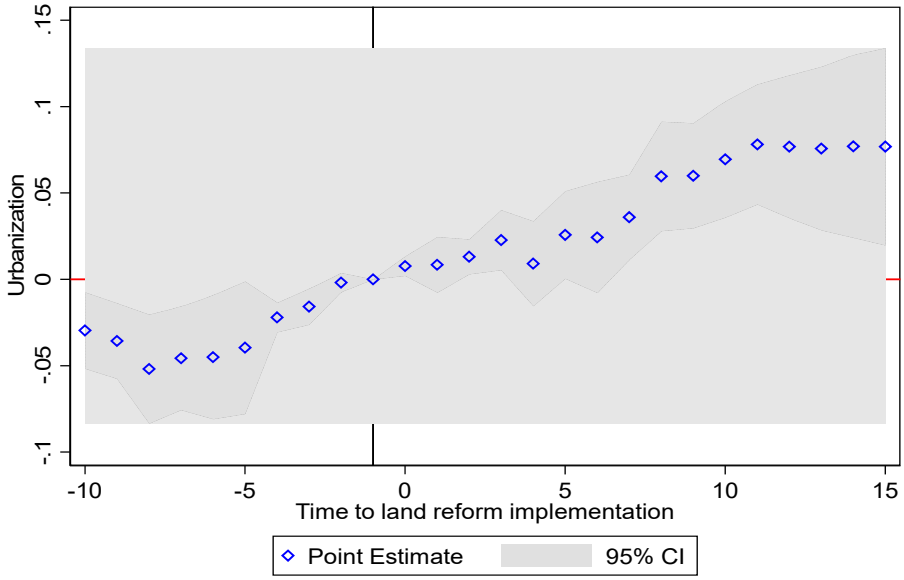
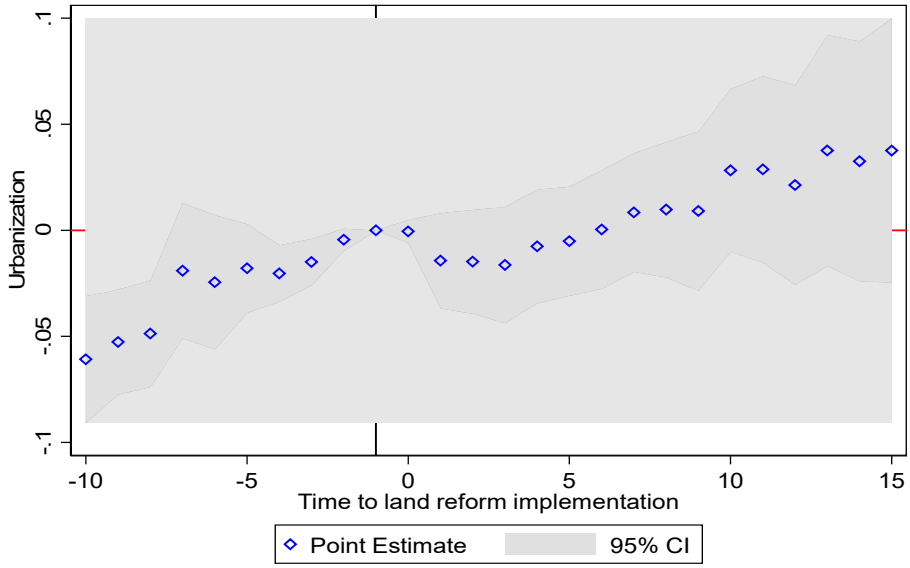


Figure 2 provides much stronger support to the postulated hypothesis, with the consolidation land reform implementation showing positive support to the urbanization outcome if we take a look at the relevant lagged variables. Thus, consolidation land reforms with transfer of end-user rights matter for urbanization, and the effect is showing up just after two years of the

reforms being implemented. However, there appears to be some significant pre-trends, thus violating the no pre-trends assumption for identification. In such instance, we can say that consolidation motive land reform implemented is strongly correlated with the outcome variable, urbanization.

Figure 3. The impact of privatization motive land reform implementation on urbanization



The privatization motive land reform implementation, as depicted in Figure 3 above, however, shows no statistically significant impact on urbanization. Thus, even if end-user rights are transferred with privatization motive, this does not necessarily lead to more people flocking towards the urban centres over time. The result points to heterogeneities in the impact of the particular motives on the outcome variable.

Figure 4. The impact of restitution motive land reform implementation on urbanization

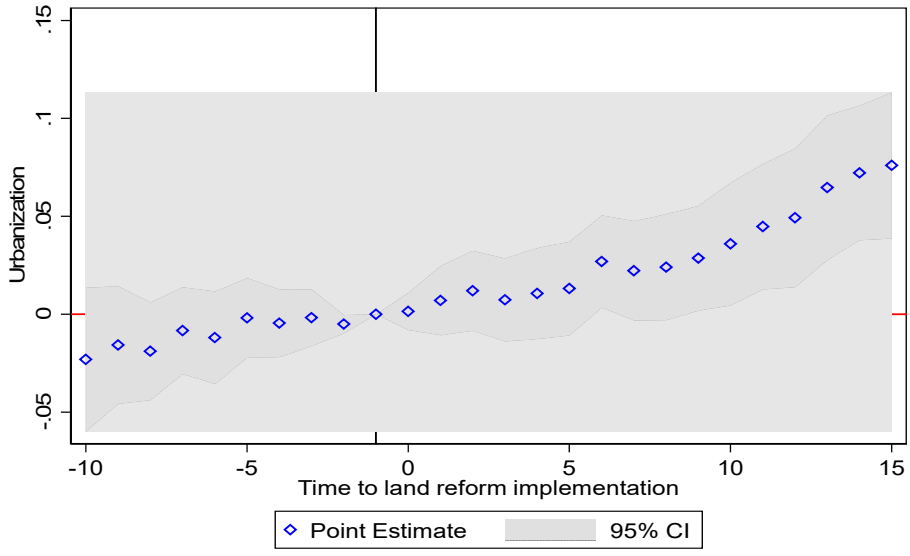


Figure 4 above shows strong support to the proposed hypothesis, especially after looking the post reform period from six years onwards. Thus, restitution motive land reforms which were implemented with transfer of end-users rights, remain instrumental in creating land market type transactions. These transactions, in turn, impacted the level of urbanization is a positive and significant way. The figure also shows no statistically significant pre-trends, thus, identification is achieved for this particular land reform implementation variable.

Figure 5. The impact of combined end-user rights motives land reform implementation on urbanization

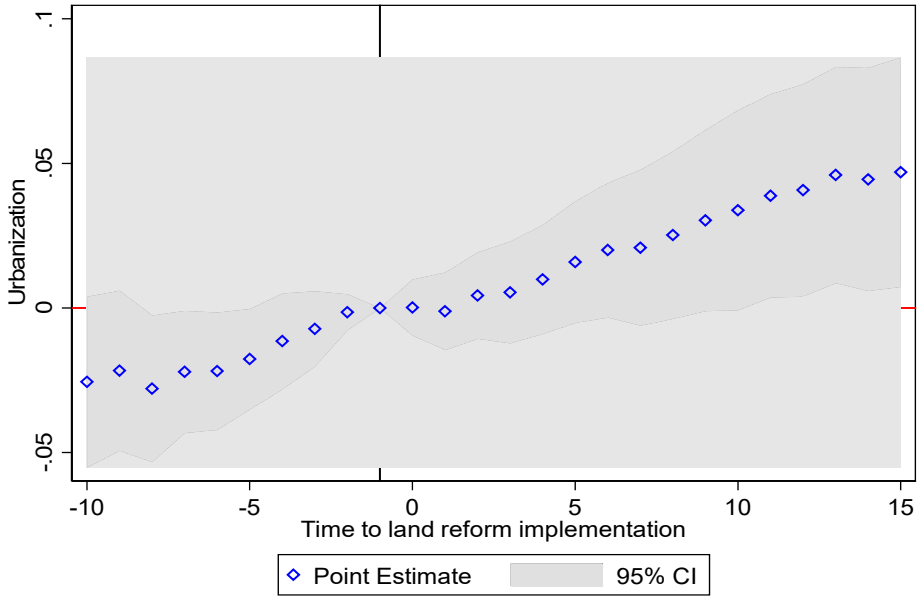


Figure 5 reveals that the land reform implementations where combined end-user rights were transferred (i.e., a combination of reform motives of distribution, privatization, consolidation and restitution), there is quite strong support for the urbanization hypothesis, especially after five years onward of the reform implementation. Thus, giving end-user rights to rural land could user in land market type transactions and that would lead to more urbanization. This could happen as with end-user rights, the beneficiaries have the option to invest more in their own land or participate in land market transactions where land could be bought and sold freely if they wish to quit agricultural production. In this instance, the second hypothesis seems to be a more plausible alternative the beneficiaries are pursuing. The pre-trends also show no apparent support (which is also confirmed by the statistical significance of the lagged variables) for parallel trends, thus, the identification is achieved.

Taking all of the above findings together, we find very good support for the proposed hypothesis that end-users land rights matter for urbanization, and the most plausible channel appears to be through land market type transactions.

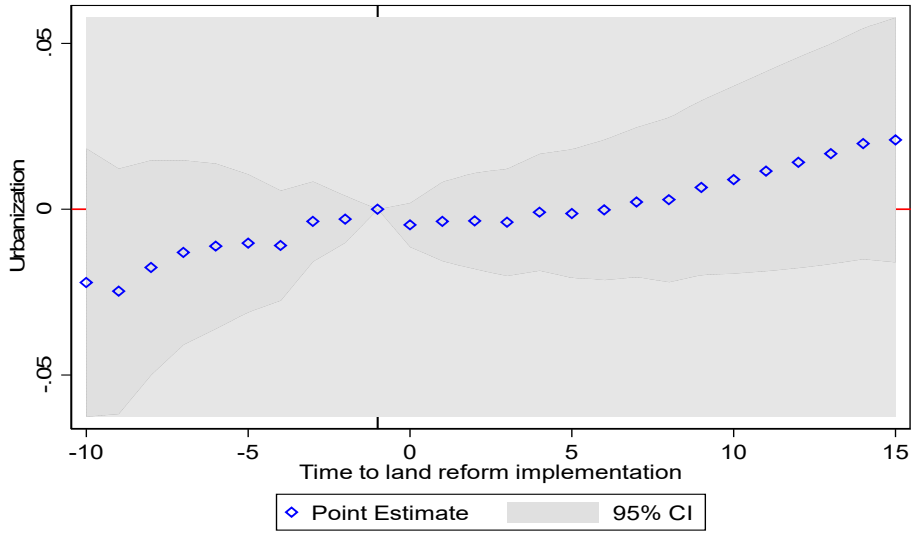
7.2. Falsification results: the impact of non-end-user rights motives land reform implementation on urbanization

The following figures show the falsification or placebo type results involving four different types of land reform implementation where end-user rights were not transferred. If our

conjecture is true, then the falsification exercise will yield neither statistically significant results nor positive results involving end-user rights reported earlier.

The falsification findings from Equation (1) are presented below. Figure 6 plots land reform implementation with improving tenure security as the motive; Figure 7 plots implementation which legally recognizes informal land transactions involving community, indigenous and religious procedures; Figure 8 shows implementation for pro-poor land reforms and Figure 9 presents land reform implementation with the combined motive of land ceiling imposition, expropriation and redistribution.

Figure 6. Falsification result: the impact of improving tenure security motive land reform implementation on urbanization



Looking at the above figure, even if the point estimates return positive slope post implementation, all coefficients remain statistically insignificant, both after and before this land reform taking place. Thus, tenure security improvement as a motive does not impact urbanization, a finding in line with our falsification conjecture.

Figure 7. Falsification result: the impact of CICRT recognition motive land reform implementation on urbanization

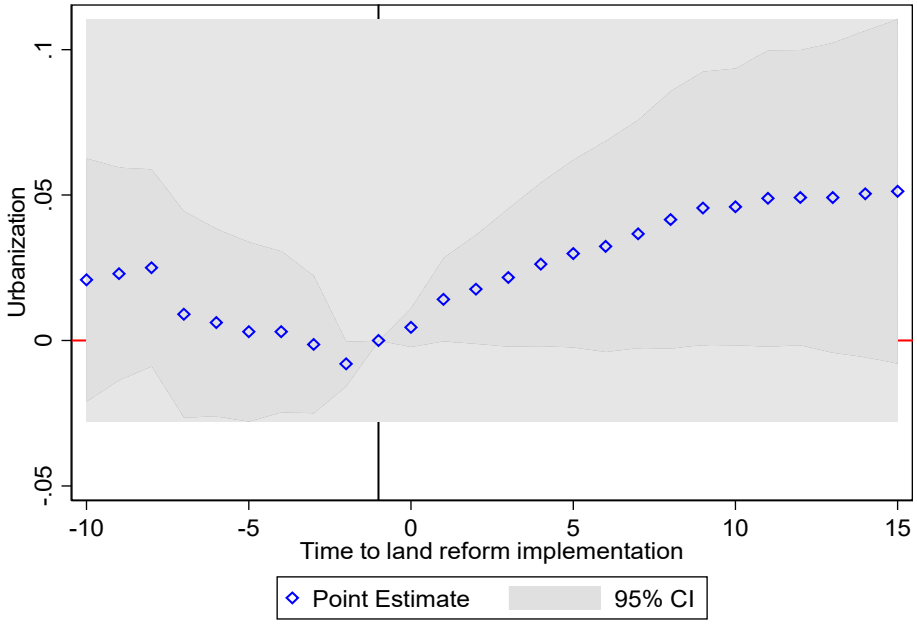
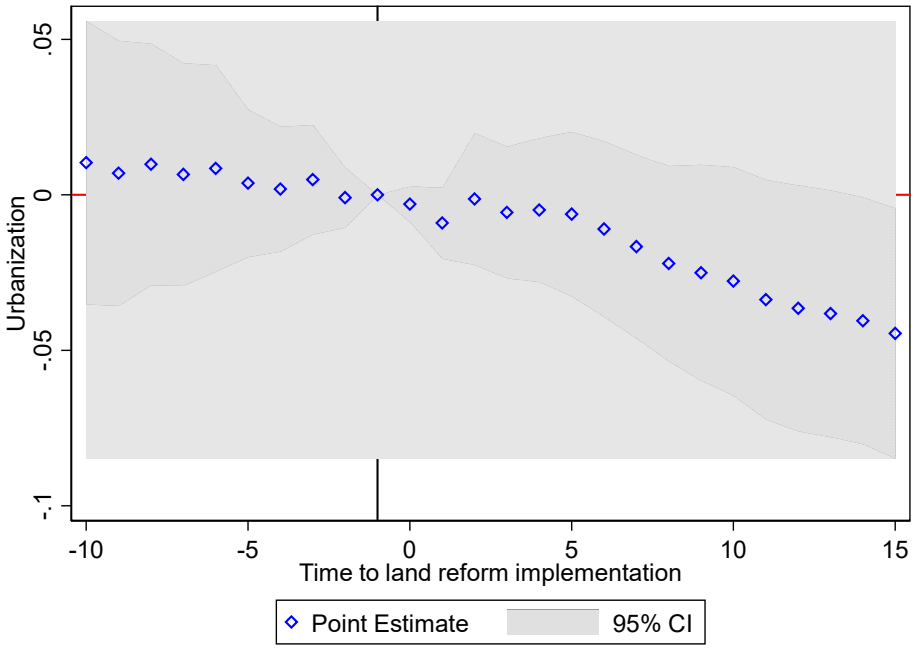


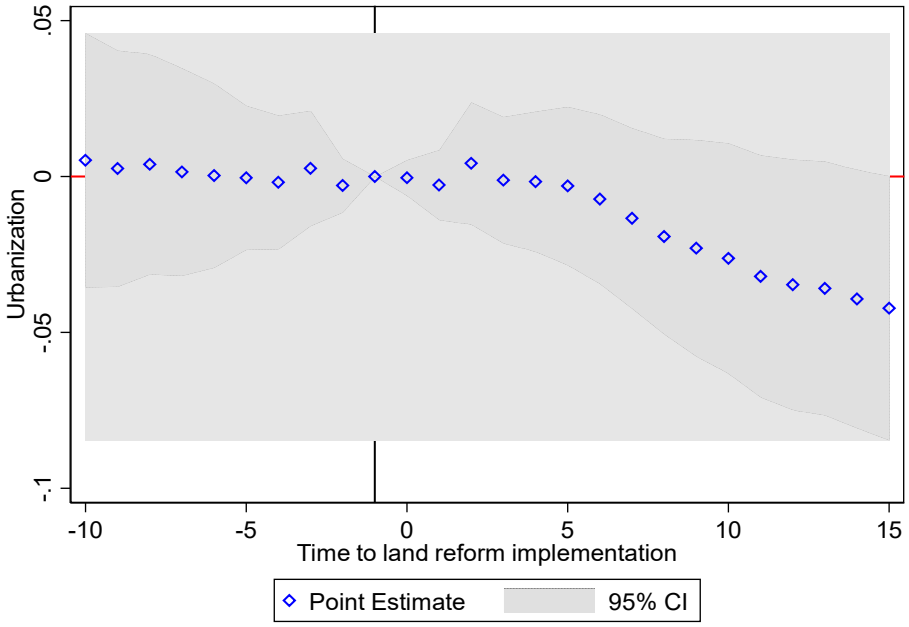
Figure 7 reveals an interesting finding, i.e., giving CICRT recognition is actually improving the propensity to urbanize both before and after this particular land reform being implemented. However, the post implementation period statistical significance bands are beyond the conventional 95% and importantly, the pre-trends show some positive impact. Thus, it does not satisfy the no parallel pre-trends assumptions, and deemed to be not showing any causal impact on urbanization.

Figure 8. Falsification result: the impact of pro-poor motive land reform implementation on urbanization



A quick look at Figure 8 above reveals that the pro-poor motive land reform implementations have no positive and statistically significant impact on urbanization. This shows a clear support of our baseline results in terms of falsification.

Figure 9. Falsification result: the impact of combined land ceiling imposition, expropriation and redistribution motive land reform implementation on urbanization



The findings from Figure 9 above also supports our main conjecture as the post implementation of the combined motive of land ceiling imposition, expropriation and redistribution reveals negative and statistically insignificant impact on urbanization. Thus, for this instance as well where end-user rights were not transferred, the land reform implementation has no positive bearing on the outcome variable, urbanization.

7.3. Results from the two-way difference-in-differences estimation

We present the following results from the difference-in-differences estimation after controlling for country and year specific fixed effects as well as relevant controls used in the Equation (1) before.

Table 2. Difference-in-differences estimation results for land reform implementations with end-users rights transferred

	Dependent variable				
Independent variables (Land reform implementation motives with end-users rights) ↓	Urbanization	Urbanization	Urbanization	Urbanization	Urbanization
Distribution	0.042*** (2.03)				
Consolidation		0.093***			

		(5.40)			
Privatization			0.100*** (2.63)		
Restitution				0.066 (1.29)	
Combination of above four motives together					0.056*** (2.71)
R-squared	0.8744	0.8743	0.8748	0.8738	0.8750
Sample size	8728	8728	8728	8728	8728
No. of countries	181	181	181	181	181
Mean of the dependent variable	49.749	49.749	49.749	49.749	49.749
Controls	✓	✓	✓	✓	✓
Fixed effects	✓	✓	✓	✓	✓
Time effects	✓	✓	✓	✓	✓

Note: The relevant t-statistics are reported in parentheses. ***, ** and * denote 99%, 95% and 90% significance levels respectively. The R-squared reported are *within R-squared*. All regressions include country specific fixed effects and time effects as well as controls. The controls are: (i) the level of urban population (in natural logarithmic scale), (ii) the urban population growth rate and (iii) the gross agricultural production index (in natural logarithmic scale).

The DiD estimates from the Table 2 above show support for the main conjectured hypothesis that the end-user rights imbibed land reform implementations have positive effects on urbanization for the overwhelming majority of land reforms. One exception is that of the restitution motive land reform, which is showing statistically insignificant, yet positive result. The statistical insignificance could be attributed to the small number of restitution motive land reforms as compared to other types of land reforms.

In regards to the magnitudes, the effects translate to around 1.7% in terms of constant elasticity for the distributive land reform implementation, i.e., one successful distributive land reform implementation will increase urbanization by 1.7 percentage points. Similarly, for the consolidation and privatization motives, these constant elasticities will be 1.03% and 0.05%, respectively. Taking the combined motive, the elasticity hovers around 3 percent. Even if the numbers seem to be small, note that the land reform implementations in consideration are not happening frequently; thus from that perspective, the constant elasticities show quite considerable and statistically significant effects over time across countries.

The control variables used (but not reported in Table 2) show expected signs and statistical significance as conjectured before. The level of urban population remains positive and statistically significant in all specifications. Similarly, the value of agricultural production index remains negative and statistically significant in all specifications, showing that the improvement in agricultural production and associated income earning opportunities are slowing down the level of urbanization. The growth rate of urban population remains positive albeit not statistically significant, indicating more of a level impact (through number of urban people) than change or growth effect.

7.4. Results from the land price variable as dependent variables

In the following section, we present results from estimating Equation (2) for 11 developed countries in the sample for two particular land reform implementations, (i) consolidation and

(ii) combined motive of end-user rights transferring reforms. As mentioned earlier, the data sample for nominal farmland prices are taken from the Knoll et al. (2017) paper and we estimate Equation (2) with the nominal farmland index as the dependent variable.

7.4.1. Results from the nominal farmland price index as the dependent variable

The following two figures (Figure 10 and Figure 11) show the impact of consolidation and combined end-user rights motives land reform implementation on nominal farmland price index for 14 advanced countries.

Figure 10. The impact of consolidation motive land reform implementation on nominal farmland price index in developed countries

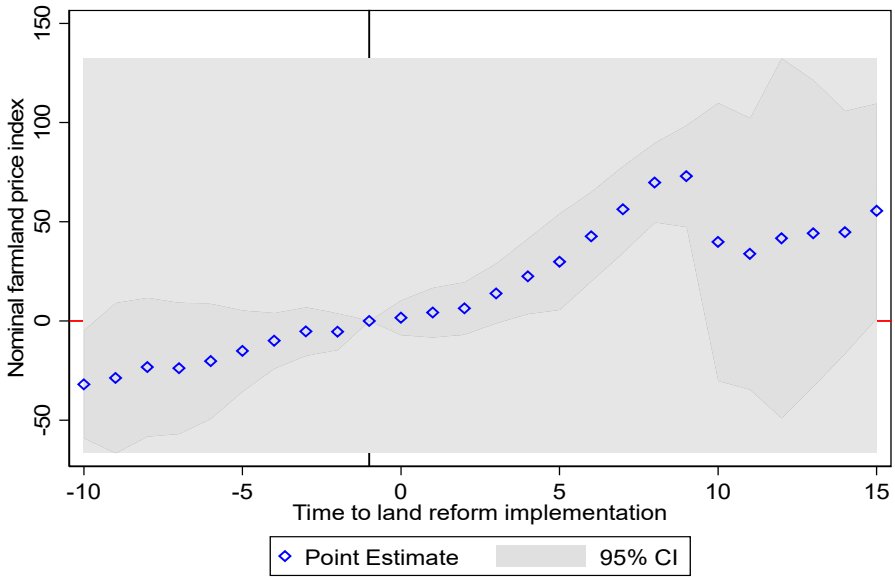
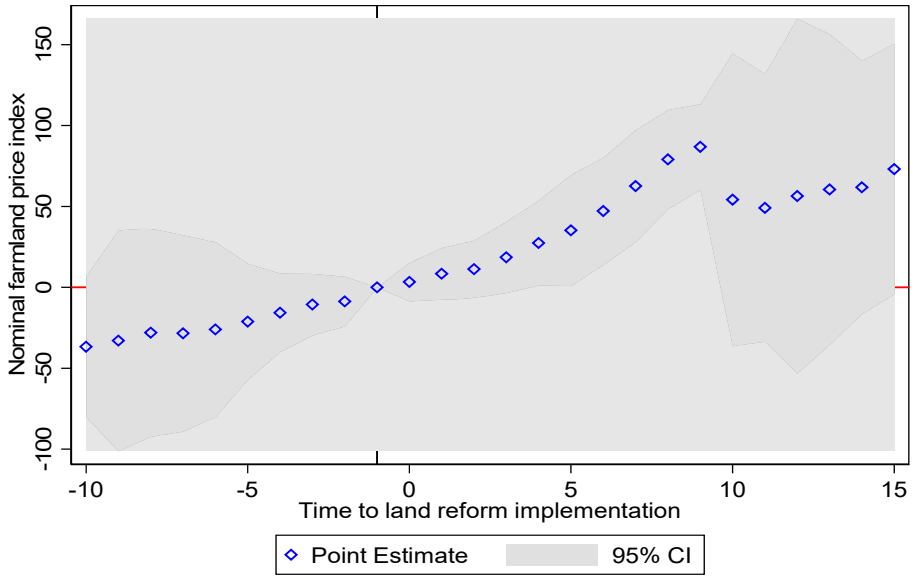


Figure 10 above reveals some interesting findings. First, there appears to be no statistically significant pre-trends, which helps in regards to causal interpretation. Second, there is statistically significant and positive impact on nominal farmland prices, which means there is strong support to the conjectured hypothesis that some particular end-user transfer oriented land reforms like consolidation above facilitates demand side of the land market, and, this in turn positively influences agricultural land prices. Third, the effect dies down from 11 years onwards, signalling that only end-user rights transfer may not last long in firming up demand, and other market enabling transactions or decisions or institutions should be put in place to keep up the demand. Overall, consolidation motive land reform implementation has a positive and statistically significant causal impact on farmland prices over short to medium run.

Figure 11. The impact of combined end-user motives land reform implementation on nominal farmland price index in developed countries



The above figure shows the impact of combined end-user rights land reform implementation on farmland price index. Similar to the Figure 10 result earlier, we find positive and statistically significant effect of combined end-user rights land reform implementation on nominal farmland price index and the effect remains consistent even after 10 periods. Thus, these combinations of end-user rights point towards possible land market demand creations, which in turn influences nominal farmland prices positively.

Taking all the empirical evidence presented above, we find very good support to our two proposed hypotheses outlined in Section 4. Thus, land reform implementations focusing on transferring end-users rights could be used to usher in land market related transactions. This, in turn, would facilitate more urbanization in a number of countries in the world. In addition, it would have positive bearing on farmland prices in developed countries.

Section 8. Concluding remarks

This chapter provides a broad overview of important issues in macroeconomics involving land. Land and macroeconomics is a wide-ranging concept to be covered within a chapter. Thus, we limit our attention to three interconnected themes. The first theme focuses on pertinent concepts involving rural land and its consequences on macroeconomic indicators like growth and development. Then, in the second theme, we delve into the issues of urban land and its dynamics on mainly urban contexts like house prices and urban development keeping in mind that housing and real estate issues also encompass economic growth and development. The last theme presents new empirical evidence where we investigate how a particular type of land reform implementation involving transfer of end-users rights to beneficiaries could usher in one interesting driver of development, namely, urbanization.

The empirical strategy uses quasi-experimental setup involving flexible event-study design and difference-in-differences technique to identify the causal effect of land reform implementation motives involving end-users rights transfer on urbanization using the recently developed major land reform database by Bhattacharya et al. (2019). In addition, the empirical analysis also uses novel data on agricultural farmland prices reported in Knoll et al. (2017) and found that the end-user rights focused land reforms played positive roles in

enhancing farmland prices, indicating plausible land market demand side mechanisms of such land reform implementations.

In regards to policy implications, the chapter's discussion and empirical analysis show that there could be some interesting policy decisions the central planner or the governments may consider. The first one would be the reforms encouraging land market development in the rural areas by helping setting up institutions supporting land related transactions including transfer of property rights to land in the rural areas. Second, the policy makers could devise proper mechanisms to boost smooth conversion of rural land to urban land, thus increasing the supply of urban land for development purpose and ameliorating possible business cycle fluctuations involving urban land. Finally, appropriate fiscal policies could be undertaken to boost the planned urban development in developing countries which would be environmentally sustainable for the future generations.

Future research could focus on the channels behind land reform implementation with end-user rights transferred and how these impact the land market development through changes in land or asset as well as income inequality.

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