

OCTOBER 2021

MARKET SYSTEMS DIAGNOSTICS: A STRUCTURAL ANALYSIS

INTRODUCTION

In 2021, LINC, working with ACDI/VOCA and Honduran partners, undertook a novel analytical activity to model the many factors that influence economic growth in Honduras. Using an approach never applied before in this way, the activity helped produce targeted and actionable recommendations for policymakers and the business community. This blog introduces this approach in the hope that the process may serve the development community.

PROJECT BACKGROUND

The [USAID Transforming Market Systems \(TMS\)](#) program in Honduras is a seven-year (2018-2025) activity designed to foster competitive, resilient, and inclusive market systems that support economic growth and provide economic opportunities that incorporate women, youth, ethnic minorities, people with disabilities, the poor, and other marginalized groups who are often excluded—or even exploited—by traditional market systems. By applying systems thinking approaches, TMS seeks to understand, diagnose, and address complex market behaviors and relationships that contribute to inequality and lack of economic growth. TMS is implemented by prime contractor ACDI-VOCA, and LINC serves as a strategic subcontractor. LINC supports TMS's systems thinking and monitoring, evaluation, and learning (MEL) activities.



Beneficiaries of the TMS Activity in Honduras

THE ANALYSIS

THE PROBLEM

In 2020, Honduras was catastrophically hit by the twin hurricanes Eta and Iota. Approximately 4.7 million people were affected, hundreds of roads and bridges were destroyed, and the agricultural sector reported losses of up to 80% (Relief Web, 2021). Overall, the impact of the hurricanes represented losses of about USD1.86 billion. These events took a serious toll on an economy already struggling from the impacts of the COVID-19 pandemic (CEPAL, 2021).

In the face of these challenges, the private sector, civil society, and government came together to identify and prioritize a set of reforms that would help Honduras overcome the multiple economic and social crises by achieving inclusive economic growth.

THE GOAL

Public and private stakeholders recognized the need to gather evidence and conduct rigorous economic analysis to ensure that development reform initiatives were properly addressed. To support these efforts, ACIDI/VOCA and LINC began an analytical activity to better understand the many interrelated factors affecting the Honduran market system and produce comprehensive and actionable recommendations for policymakers that would improve market system performance, resilience, and inclusion.

LINC experts, working with TMS field staff and technicians, and in collaboration with the [Universidad Nacional Autónoma de Honduras \(UNAH\)](#) and the [Consejo Hondureño de la Empresa Privada \(COHEP\)](#), conducted a system mapping activity to look for the evidence needed to inform a public-private dialogue process that would guide the efforts to achieve the goal at hand.

THE METHODOLOGY

Traditionally, when addressing economic growth, experts have analyzed each factor - whether taxes, crime, innovation - independently, but few have tried to understand how these multiple issues interact in ways that generate larger patterns in the economy. In doing this research, the team saw the need for an approach that was able to sort through the complexity of the many factors impacting market system performance and inclusive growth in Honduras.

About Factor Mapping

A core tenet of factor mapping and systems thinking is that rather than being driven by a single system component in isolation, it is the interaction of system components that leads to an overall emergent outcome of a complex system.

The team wanted to prioritize policy issues that would have a comprehensive, or systemic, impact, so they decided to use a structural analysis technique called “factor mapping” (Valcourt et al., 2019). By enabling the study team to rigorously map the interaction of factors that influence Honduran market system outcomes, the factor mapping methodology revealed possible leverage points that could have the strongest influence over how the Honduran market system competes, responds to a disruption, or engages a specific population group, including the poor, the disadvantaged, or the excluded.

Adopting, and adapting, the factor mapping methodology with qualitative approaches including interviews, qualitative coding, and the formation of context-relevant system structures based on stakeholder stories created a novel process that helped the team to understand the trends and characteristics of the Honduran market system and pinpoint what drives or inhibits inclusive growth.

THE PROCESS

Creation and analysis of a factor map for the Honduran market system involved a multi-step process for the identification of factors, factor interactions, dynamics, and identification of leverage points.



Figure 1

STEP 1 - LISTENING TO STAKEHOLDERS

The team engaged Honduran market system stakeholders to gather as many diverse perspectives as possible, which allowed them to develop a list of factors that drive market system development in Honduras. This was more than just getting opinions; it was about trying to understand how stakeholders saw and interpreted the reality of doing business in Honduras. The team facilitated focus groups to unpack and learn from the stories and experiences of local business stakeholders.

The focus groups revealed multidimensional aspects of the problem at hand. The stories told by the stakeholders began to show how distinct, yet interrelated issues contributed to the larger problem that they wanted to tackle. For example, they realized that issues like job formalization, taxes, local public services, and trust were linked together.

Recap Step 1: The TMS team facilitated focus groups with stakeholders of the Honduran market system to gather perspectives. The focus groups revealed multidimensional aspects of the problem at hand.

STEP 2 - FACTOR IDENTIFICATION

The team then conducted quick reviews of the interviews to pull out factor themes. Through a process known as qualitative ‘coding’, they identified factors for the systems that underlie the problem and/or established goals and results from Step 1.

The intention of this initial review phase was to develop as complete a list of factors as possible, and to clearly define these factors. This process involved various members of the study team. The team then distilled, filtered, named (and renamed) the factors in an iterative and rigorous process that emerged with a list of factors and definitions to include in the next step of factor mapping.



Figure 2

The word-cloud shows some of the main factors identified by the TMS team

Recap Step 2: The TMS team coded the interviews and came up with a list of factors that underlie the problems, and definitions.

STEP 3 - VALIDATING DYNAMIC HYPOTHESES

To start to structure the connections between the factors identified in step 2, the team came up with some 'dynamic hypotheses'. Generating dynamic hypotheses starts with telling a story for how a particular pattern of system behavior emerges over time. The stakeholder stories showed some dynamic patterns or trends in the issues. From these patterns, the team was able to create a series of dynamics hypotheses and place them within distinct systems archetypes.

Systems Archetypes

Generic Casual Loop Diagram template that shows behavior patterns associated with common system problems seen across diverse scenarios, domains, and sectors.

Systems archetypes are commonly recurring system structures that have been found to produce similar system behaviors regardless of the system. The benefit of identifying system archetypes that mirror system behaviors or patterns within a particular context (in this case the Honduran market system), is that because system archetypes have been seen so frequently throughout time, there exists a history of solutions to such system structures to minimize vicious cycles and sub-optimal system behavior.

By spotting archetypes within the aforementioned dynamic hypotheses, the research team was able to map factor interactions and dynamics within a useful systems tool called a causal-loop diagram (CLD). CLDs are a way to visualize and discuss feedback mechanisms, which represent circular causality between factors that drive system behavior and change over time. Feedback loops are characterized as reinforcing (R: causing exponentially increasing system behaviors - found as a positive-sum of negative influence polarities in a loop) and balancing (B: causing equilibrating or goal-seeking system behaviors - found as a negative-sum of negative influence polarities in a loop).

Feedback loop analysis requires converting the factor map into a causal loop diagram, wherein the factor interactions are designated as positive ("+": one factor increasing causes the other to increase, or vice versa - a direct relationship) or negative ("-": one factor increasing causes the other to decrease, or vice versa - an inverse relationship). A simple example of a feedback loop can be seen in Figure 3 (Neely et al., 2016).

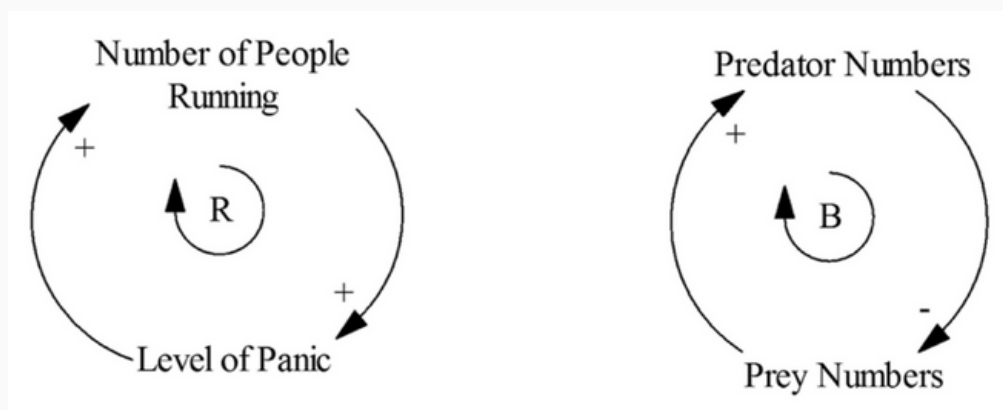


Figure 3

CLD archetypal structures representing the dynamic hypothesis from the various stories and experiences of local business stakeholders were then shared back with these stakeholders, who were asked if the causal logic was correct, what other factors or issues were missing, and if there were other causal connections. The process of sharing these CLDs with stakeholders enabled the team to ground-truth a preliminary factor map by combining the CLDs within one market system CLD. The participatory process meant that the team was not just imposing their understanding but rather building a collective understanding of how the system was working.

Recap Step 3: The TMS team developed dynamic hypotheses, defined systems archetypes that fit these dynamic hypotheses and drew them as CLDs, and consulted their validity with the relevant stakeholders through a participatory process.

STEP 4 - QUANTIFYING FACTOR INTERACTION STRENGTH

By now, the team had a long list of factors and an idea of how all the factors influenced each other within sub-system archetypes represented as CLDs.

Now the team needed to validate whether this causal logic was true. To do this, they surveyed Honduran market system experts to evaluate each of the distinct interactions. The team asked first whether a direct relationship existed between the two factors – e.g., that crime influenced business sales – and then if the relationship existed, they asked the experts to rate this relationship as weak, average, or strong, coding these 1, 2 or 3. This process happened for all 118 interactions that were found between the 43 factors identified (as seen [here](#)).

Example

Take a few issues: rule of law, crime, business growth and job creation. Based on the hypotheses we know that the greater the rule of law the less crime there would be. Business sales on the other hand are affected by crime. It is estimated 11.7% of business sales in Honduras are lost to crime. The slower businesses grew, the less jobs they created. The fewer jobs there were in an area, the more likely that youth would resort to crime and theft as alternatives.

This process helped to ensure that the causal logic that was identified was valid. In some cases, where there was significant deviation in ratings or where the ratings were considered weak, the team made corrections to ensure that they had a valid model before analysis.

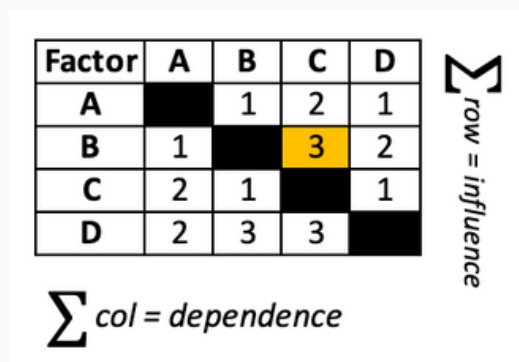


Figure 4

What resulted from this process was a validated “cross-impact matrix” housing all 118 interactions and their strengths. This matrix represents a model for how these factors interconnect to drive market system outcomes, offering a way to reveal system leverage points. The process of analyzing an impact matrix to identify system leverage points is explained in Step 5. An example impact matrix is shown to the left, where rows in the matrix represent how a factor (i.e., Factor A), influences other factors, and columns represent how a factor (i.e., Factor A) is influenced by the other factors (also known as dependence).

Recap step 4: A team of experts came up with a validated “cross-impact matrix” containing 118 interactions between the 43 factors identified, and the strength of such interactions.

STEP 5 - PERFORMING STRUCTURAL ANALYSIS

The cross-impact matrix resulting from the previous step was analyzed to evaluate system leverage points. Leverage points were based on an evaluation of each factor’s influence and dependence.

- **Influence** scores represents the cumulative impact a factor has on the other factors, evaluated as the sum of connection scores in each factor’s row. For example, Factor A’s influence score would be $(1 + 2 + 1 = 4)$, the sum of all connection strengths in Factor A’s row (horizontal).
- **Dependence** scores represents the cumulative impact factors have on a particular factor, evaluated as the sum of connection scores in each factors column. For example, Factor A’s dependence score would be $(1 + 2 + 2 = 5)$, the sum of all connection strengths in Factor A’s column (vertical).
- **Betweenness Centrality:** Betweenness centrality quantitatively measures a factor's ability to ‘bridge’, within the shortest paths, other factors, and thus measures that factor’s overall interconnectedness within the system.
- **Leverage points** are factors with high influence scores (a large influence on other factors), low dependence scores (a low dependence or vulnerability to other factors), and high betweenness centrality.

Leverage Points

The factors in the market system model with the greatest potential to influence market system outcomes.

Placing the normalized influence and dependence scores for each factor on a 2-dimensional Influence vs. Dependence chart - known as an Influence Map - tells a story on the drivers of system outcomes. Dividing the Influence Map into four quadrants (I, II, III and IV) lend insight into:

- which factors to target with policy and practice (Quadrant II)
- which factors are unstable and need to be protected (Quadrant I - proceed with caution!)
- which factors are an outcome of system interactions and possible locations for monitoring systems change and health (Quadrant IV)
- which factors are relatively incidental on overall system outcomes (Quadrant III)

The following figures shows how the impact matrix highlighted before (a) would map onto an influence map (b) from this example. Factor D (and possibly Factor B) would be a leverage point (high influence low dependence), while Factor C would represent a potential indicator to measure to evaluate system change and health.

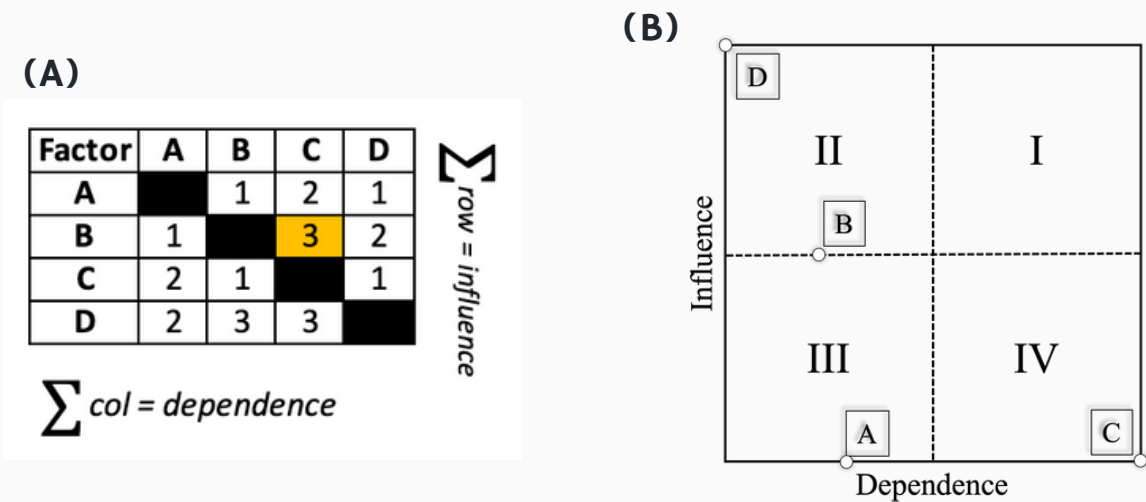


Figure 5
Source: Walters, J.P et al.

Recap step 5: The cross-impact matrix resulting from the previous step was analyzed to evaluate system leverage points based on an evaluation of each factor's influence and dependence. This evaluation provided insights into which factors to target with policy and practice, which factors were unstable and needed to be protected, which factors were an outcome of system interactions and needed monitoring for systems change and health, and which factors were relatively incidental on overall system outcomes.

STEP 6 - EVALUATING LEVERAGE POINTS

Doing the structural analysis process outlined in Step 5 on the cross impact matrix and resulting factor map for the Honduran market system model allowed the team to assess places to intervene with leverage in a more scientific way.

Leverage point factors were the most influential, least dependent, and most central of the factors. The analysis of factor influence, dependence, and betweenness enabled the team to identify two sets of leverage points and hypothesized to have the greatest potential for impact on the development of the Honduran economy in the short, medium, and long-term.

Leverage Points with Greatest Long-Term Effects	Leverage Points with Medium/Short-Term Effects
Rule of law, government administration, corruption, education, and fair competition	Entrepreneurship, market access, digitalization, work force skills

Recap step 6: The team defined criteria to measure leverage points based on factor influence, dependence, and betweenness and came up with a set of leverage point factors with greatest hypothesized long-term effects, and a set of leverage points with medium/short-terms effects in the Honduran economy.

STEP 7 - REPORTING AND ACTION

Systems thinking and modeling were used for this study to help Honduran policymakers, academics, and business leaders develop a deeper and more holistic analysis of how many seemingly distinct factors collectively affect the Honduran economy.

Each of these factors – rule of law, competitiveness, innovation – had been analyzed as separate isolated issues, however, no study had looked at how they interacted together as part of a broader system - a key aspect to knowing where to engage with policy and action. With the findings of the structural analysis, TMS, together with its institutional local partners, held multiple stakeholder workshops to discuss the evidence and then gather recommendations for priority reforms and interventions.

This process resulted in the publication and presentation on June 29, 2021 of the four-year [National Enterprise Strategy](#) to presidential candidates in Honduras by the Council of Private Enterprise.

TMS Honduras is now in the process of supporting implementation of that plan and strategy with its partners. This structural analysis method has provided direction to guide short, medium, and long-term actions needed to address the root causes for underperformance of the Honduran economy.

Recap step 7: The results of the study were shared with stakeholders to gather recommendations for interventions. The results were shared with Honduran presidential candidates for their consideration by the Council of Private Enterprise.



Honduran national newspaper reporting on the presentation of the Market Systems Diagnostics and its findings to the Honduran presidential candidates by COHEP.

FINAL THOUGHTS

Problems that are systemic in nature cannot be isolated from the system. To address these types of problems, we need to understand the multiple components of the system and how they interact to produce the problem. Structural analysis provides a step-by-step method to analyze the underlying system.

As people, we tend to try to simplify what is complex to address our lack of feeling of control or efficacy over something. This premature simplification can lead to sub-optimal decision-making and unintended negative consequences since we have neglected important aspects of the problem by simplifying it at first.

The alternative approach is to actively engage with complexity. Given our cognitive limitations to comprehend all the complex aspects of a problem, we can use structural analysis to iteratively analyze the different aspects and perspectives of the problem, and then put these parts together as a comprehensible and useful whole.

This methodology makes it less likely we will jump to conclusions too quickly when facing important complex and ambiguous problems.

Structural analysis allows participants to improve their ability to recognize patterns - by learning to see archetype problems and understand the structures that cause them - we can become better systems practitioners by thinking systemically in our day-to-day work.

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