1. : (Institutional Change, Government Size, and Wagner's
Law)
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(empirical studies in institutional change)
(institutional analysis)

8. Abstract: The main purpose of this study is to demonstrate the dynamics of institutional change that underlie Wagner's Law for the US. This study, on one hand, applies the concepts of "institution" and of "institutional change" rooted in the tradition of *neo-institutional economics* to help explain the evolutionary property of Wagner's Law. [Note: This study also introduces some (new) concepts of *institutions*.] Fundamental to this new approach is the recognition that *every solution to a problem (realized through emergence of an institution) initiates a new process of institutional change with the potential to be problematic*. On the other hand, the conceptual exposition of Wagner's Law being evolutionary relates directly to the empirical investigation of institutional dynamics. The results suggest that fluctuations in real government size have been permanent since the welfare system operated and explain the fact that the US has increasingly recognized the importance of controlling government size in the 1990s.

9. **(Introduction and Background)**

For most developed countries, the study of the long-term trend of government size has become a major issue (see, for example, Gemmell, 1993, Borre and Scarbrough, 1995; Feldstein, 1997). In the public finance literature, the investigation of long-run government activities can be traced at least as far back as the mid-nineteenth century in the work of Adolph Wagner. Based upon Wagner's hypothesis of "increasing state activity" (i.e. "Wagner's Law"), the government sector will become relatively more important as the economy expands. For a growing economy, the size of government usually will expand, for example, to handle the rising demand for legal regulations, cultural and recreational activities, and various welfare services. In short, Wagner's Law reflects the following scenario: changes in social institutions (cause) for a growing economy lead to rising government expenditures (effect). The main purpose of this study, therefore, is to conceptually and empirically demonstrate the dynamics of institutional change that underlie Wagner's Law for the US. Fundamental to this new methodology is the recognition that Wagner's Law is evolutionary (dynamic) in nature. This interpretation implies that Wagner's Law reflects a continuum of institutional change. To fully expound Wagner's Law, it is necessary to take a long view to consider the underlying structure (institution). Thus, the investigation of Wagner's Law in this study stresses the importance of institutional forces upon the changing process of government size in the long run. To conceptually explore the dynamics of institutional change, this study applies the concepts of "institution" and of "institutional change" rooted in the tradition of neo-institutional economics to help explain the evolutionary property of Wagner's Law. Also, the contemporary advances of time series analysis have equipped researchers with further techniques to explore Wagner's Law. Recent studies include, for example, Hondroyiannis and Papapetrou (1995), Lin (1995), Afxentiou and Serletis (1996), Bohl (1996), Park (1996), and Payne and Ewing (1996). These studies, however, fail to stress the evolutionary property of Wagner's Law. This study applies the estimation methods developed by Campbell and Mankiw (1987) and Cochrane (1988) to observe the dynamics of institutional change. In this context, the empirical version of Wagner's Law is established from the fact that the high degree of persistence of fluctuations in government size is similar to that of output fluctuations.

10. **(Methods, Results and Discussions)**

(1) Some (New) Concepts of ***Institutions***

An institution is a socioeconomic system characterized with a set of exogenous and endogenous variables. This socioeconomic system is dynamic and semi-closed. Its manifestation is a function of the interrelated variables and time.

Institutional Equilibrium (Type A): For a four-variable system characterized with two exogenous variables (A & B) and two endogenous variables (C & D) at (time) $t = t_0$, an institutional equilibrium is sustained when variables A and B remain exogenous and variables C and D remain endogenous at $t = t_1$. It should be emphasized that the concept of institutional equilibrium is different from the conventional concept of economic equilibrium. Institutional equilibrium refers to the state of no institutional change. This dynamic system, however, is still in motion.

Institutional Equilibrium (Type B, Institutional Stability): For a system characterized with two exogenous variables (A & B) and two endogenous variables (C & D) at $t = t_0$ and increasing exogenous and/or endogenous variables at $t = t_1$, an institutional equilibrium is maintained when variables A and B still remain exogenous and variables C and D endogenous at $t = t_1$. Generally, if a system is characterized with increasing variables over time, then this system is more likely to change.

Institutional Change: For a four-variable system characterized with two exogenous variables (A & B) and two endogenous variables (C & D) at $t = t_0$, an institutional change occurs when variable A or B becomes endogenous and variable C or D becomes exogenous at $t = t_1$. This refers to the situation that this dynamic system has changed over time. The dynamics of institutional change are typified by *speed* and *path*.

Institutional Competition: For two individual systems, institutional competition arises when the two systems characterized with one (or more) similar endogenous variable(s). This refers to the first type of dynamics between institutions.

Institutional Cooperation: For two individual systems, institutional cooperation exists when the two systems characterized with one (or more) similar exogenous variable(s). This refers to the second type of dynamics between institutions.

Institutional Connection: For two individual systems, institutional connection occurs when one (or more) variable(s) associated one system as exogenous and the other system as endogenous. This refers to the third type of dynamics between institutions and, in particular, highlights the possibility of institutional merger.
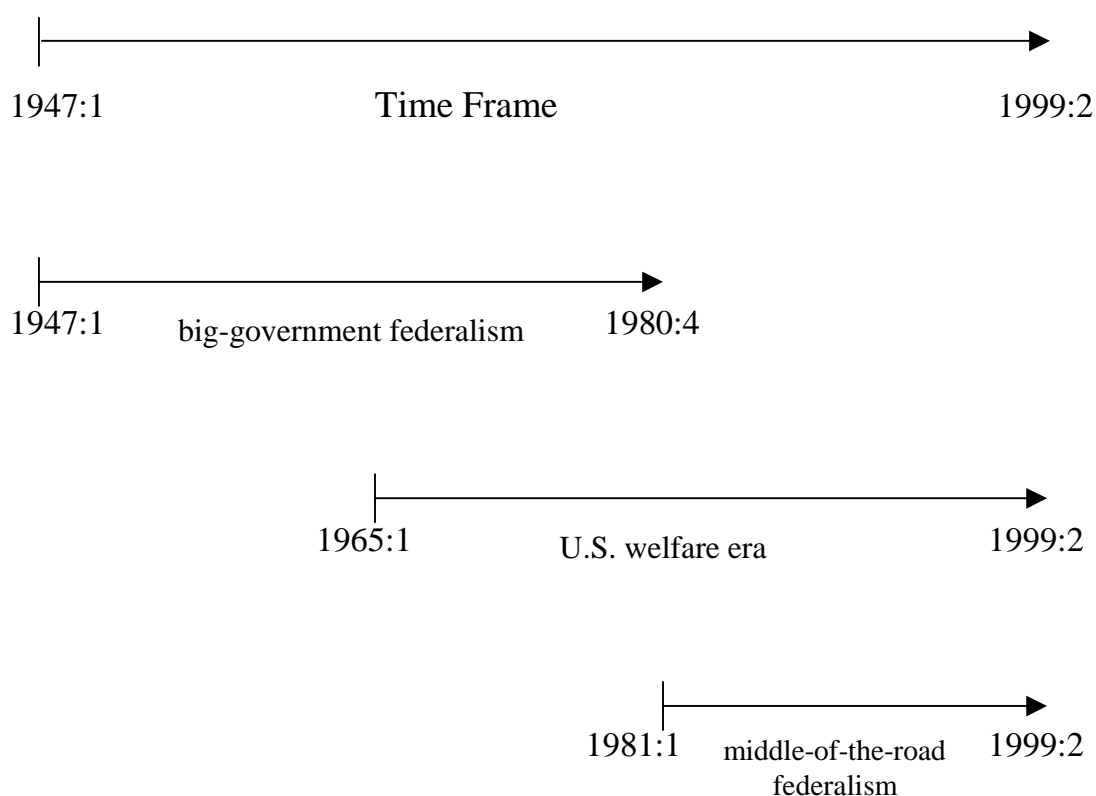
(2) The Dynamics of Institutional Change

This study primarily differs from other studies of Wagner's Law in the explicit consideration of institutional change. In particular, the meanings of institutional change are twofold. First, institutional change is understood as *the emergence of a new institution*. Second, institutional change is defined as *the evolutionary process of an institution.*

To the institutionalist, human nature is not static and human life is problem-oriented. In short, the nature of the economy is evolutionary rather than mechanical. Institutionalists use *institutions* rather than individuals as their units of analysis. In its naked form, institutional analysis is an analysis of process. **The beginning of a new institution can be recognized as a solution to a problem that germinated before its emergence. However, every solution to a problem (realized through emergence of an institution) initiates a new process of institutional change with the potential to be problematic.** The dynamic process of institutional change is a continuum. This process evolves and serves itself as a value judgement process, i.e. a process of valuation.

In reality, various institutional forces might move together and, therefore, mutually interact. For instance, the process of one institutional change might start earlier than the process of the other institutional change. Their forces might strengthen or weaken each other for a concurrent period of time. Thus, it is necessary to trace the duration of each individual change. Figure 1 illustrates the dynamic process of institutional change. In this study, institutional forces that underlie Wagner's Law for the US include the welfare system and the federal system (of government). These two systems are significant for explaining the long-term trend of government size. In the US, legislation of Medicare and Medicaid in 1965 can be symbolized as a landmark of "welfare era." The programs of Medicare and Medicaid, considered from their attribute and coverage, are national-level welfare programs. Medicare is a federal program for financing the medical care of people aged 65 and older; Medicaid is a federal-state financing program for the medical services of low-income people. The US federalism, according to Shannon (1997), could be classified into three stages: state-dominant federalism (1789-1933), Washington-dominant federalism (1933-late 1970s), and middle-of-the-road federalism (1980s-present).

Figure 1. The Dynamic Process of Institutional Change

1947:1   Time Frame   1999:2

1947:1   big-government federalism   1980:4

1965:1   U.S. welfare era   1999:2

1981:1   middle-of-the-road federalism   1999:2

(3) Results

In the literature, Beck (1976, 1979a, 1979b, 1979c, 1981, 1982, 1985) has continuously emphasized the investigation of real (rather than nominal) government size and shown that real size of the government sector has risen less than nominal size. This study follows Musgrave's interpretation of Wagner's Law and, consequently, examines the share of real government expenditures in real *GDP* series for different levels of government. The investigation of *real* government size, at the same time, is consistent with that of *real* output in the macroeconomic literature. Quarterly data are taken and adapted from the DRI Basic Economics Database (formerly Citibase). Consumption expenditures (i.e. government purchases of final goods and services) are converted into real terms with the implicit price deflator for government purchases

of final goods and services with respect to different levels of government. Transfer payment expenditures, unlike consumption expenditures, are not included in national income accounting and are deflated by the price index for personal consumption expenditures. Thus, the real total government expenditures are arrived by summing the respective deflated amounts of the consumption and transfer components. The real government share series, as a result, are obtained by dividing real total expenditures into real *GDP* and are sequentially investigated for the overall, the federal, and the state and local levels of government.

This study uses the persistence measures proposed by Campbell and Mankiw (1987) and Cochrane (1988) to sequence the institutional dynamics. Table 1 reports the results for the 1965:1-1980:4 period. The results reported for this period reflect the consequences of two mutually interacting changes (for the welfare system and big-government federalism). The $\hat{V}^k$ (Cochrane's measure of persistence) and $\hat{A}^k(1)$ (measure of persistence developed by Campbell and Mankiw) values indicate a high degree of persistence of fluctuations in real government size, especially at the overall and state and local levels. Thus, one can reasonably infer that the welfare system is significant for explaining this high level of persistence. Table 2 reports the results for the period 1981:1-1999:2. The $\hat{V}^k$ and $\hat{A}^k(1)$ values are all well above unity and strikingly large at all levels of government. This high level of persistence, in fact, explains the fact that the US has gradually taken steps to control government size in the 1990s. The results for this interval also reflect the consequences of two mutually interacting changes (for the welfare system and middle-of-the-road federalism). Thus, one might boldly surmise that the change in the US federalism in the 1980s may actually lead to a more balanced but, in a sense, *unstable* system. In short, fluctuations in real government size at all levels of government have become permanent since then. Table 3 reports the results for the 1965:1-1999:2 period. The $\hat{V}^k$ and $\hat{A}^k(1)$ values for these two periods further confirm that fluctuations in real government size, in fact, have been permanent since the welfare system operated. The results, overall, confirm a high degree of persistence of fluctuations in real government size at all levels of the US government for the time periods 1965:1-1980:4, 1981:1-1999:2, and 1965:1-1999:2.

Table 1. Nonparametric Estimates of Persistence in Real Government Size, 1965:1-1980:4

Window size (k)	$\hat{V}^k$			$\hat{A}^k$		
	Overall	Federal	State & Local	Overall	Federal	State & Local
5	1.711	1.239	2.267	1.321	1.118	1.603
	(0.610)	(0.442)	(0.808)			
10	1.597	1.129	2.871	1.276	1.067	1.804
	(0.771)	(0.545)	(1.385)			
15	1.157	0.857	3.124	1.086	0.930	1.882
	(0.673)	(0.499)	(1.818)			
20	0.878	0.594	3.579	0.946	0.774	2.014
	(0.585)	(0.396)	(2.386)			
25	0.935	0.594	4.331	0.977	0.774	2.216
	(0.694)	(0.440)	(3.213)			
30	1.000	0.514	5.147	1.010	0.720	2.415
	(0.810)	(0.416)	(4.169)			

Note: Standard errors are in parentheses.

Table 2. Nonparametric Estimates of Persistence in Real Government Size, 1981:1-1999:2

Window size (k)	$\hat{V}^k$			$\hat{A}^k$		
	Overall	Federal	State & Local	Overall	Federal	State & Local
5	2.337	1.607	3.678	1.608	1.280	2.385
	(0.774)	(0.532)	(1.218)			
10	2.427	1.542	4.982	1.639	1.254	2.776
	(1.088)	(0.691)	(2.233)			
15	2.365	1.512	5.622	1.618	1.242	2.949
	(1.279)	(0.817)	(3.039)			
20	2.545	1.563	6.265	1.678	1.263	3.113
	(1.576)	(0.968)	(3.880)			
25	2.709	1.565	6.591	1.731	1.263	3.193
	(1.867)	(1.078)	(4.542)			
30	2.470	1.399	5.889	1.653	1.195	3.018
	(1.859)	(1.053)	(4.431)			
35	2.030	1.084	4.420	1.499	1.051	2.615
	(1.646)	(0.879)	(3.584)			

Note: Standard errors are in parentheses.

Table 3. Nonparametric Estimates of Persistence in Real Government Size, 1965:1-1999:2

Window size (k)	$\hat{V}^k$			$\hat{A}^k$		
	Overall	Federal	State & Local	Overall	Federal	State & Local
5	1.839	1.345	2.561	1.386	1.160	1.773
	(0.444)	(0.325)	(0.619)			
15	1.610	1.253	3.550	1.297	1.119	2.087
	(0.635)	(0.494)	(1.401)			
25	1.286	1.066	4.336	1.159	1.033	2.307
	(0.647)	(0.536)	(2.181)			
35	1.278	1.114	4.442	1.156	1.055	2.335
	(0.757)	(0.659)	(2.630)			
45	1.272	1.313	3.634	1.153	1.146	2.112
	(0.851)	(0.878)	(2.431)			
55	1.402	1.530	2.544	1.210	1.237	1.767
	(1.035)	(1.130)	(1.878)			
65	1.521	1.839	1.090	1.261	1.356	1.157
	(1.219)	(1.474)	(0.874)			

Note: Standard errors are in parentheses.

(4) Discussions

In recent years, the study of *institutional change* has become increasingly important. Attempts to conduct systematic empirical studies in institutional change, as a matter of fact, are still in their infancy. The dynamics of institutional change, as illustrated above, are typified by *speed* and *path*. Using (feasible) time-series techniques, this study tries to sequence the dynamics of institutional change and stresses the importance of institutional forces upon the changing process of the U.S. government size in the long run. Structural modeling of Wagner's Law is a formidable task. It appears that the workable concepts (of institutions) developed in this study might lead to some clear theorizing about the changing institutional structure.

11.   (Self-Evaluation)

(1)   (the 74th Western Economic Association International Conference in San Diego, California, July 6-10, 1999, the 69th Southern Economic Association Annual Conference in New Orleans, Louisiana, Nov. 21-23, 1999, &
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